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Prevents Dust

Madison Street, Madison, Wisconsin, constructed with "Tarvia-X," penetration method, 1912.

Here's a Town that Believes in Good Roads!

Did you ever see a more interesting lay-out of a city than this of Madison?

Lake-fronts at top, bottom, and end. And what a waist-line! A lithe young American city of the very best and most progressive type.

Its streets are its special care. Its motor-cars are so many, its trucking is so heavy, that the town demands streets that are dustless, mudless and bumpless.

Therefore, it is a Tarvia town.

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Madison began with Tarvia in 1908. The people liked it so well that street after street has been treated with Tarvia.

The officials gave the people what they wanted, namely, streets without dust, without mud, without noise, and without big maintenance expense.

Madison continued to use Tarvia extensively during 1917 and the Tarvia mileage in Madison will be bigger this year.

The Street Superintendent has written recently in a published article about the streets of Madison:

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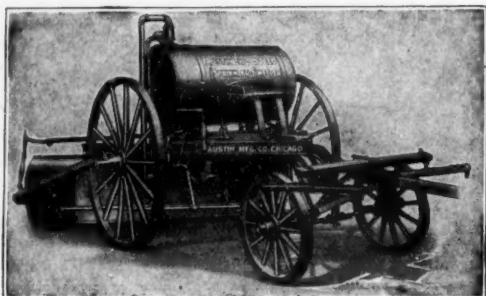
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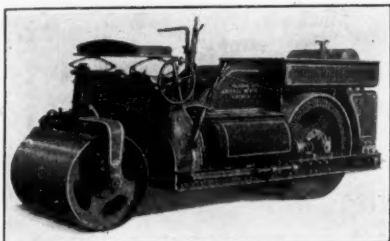
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Municipal Journal

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No. 19

MUNICIPAL DAM AT FORT DODGE

Used in Connection with Power House to Create Electric Power for the Water Works Pumping Plant and for Commercial Use—Also Forms Lake Used as a Pleasure Resort.

The city of Fort Dodge, Iowa, with about thirty thousand population and located on the Des Moines river, conceived the idea of building a municipal dam, with two objects in view: First, a financial investment that would be profitable to its citizens from the sale of power that would be developed; and, second, the creation of a lake that could be utilized for pleasure purposes. Fort Dodge being an inland city and a long distance from any large body of water, the lake idea for fishing, boating and bathing proved to be very popular. The citizens were determined, however, that the project should be municipally owned and controlled. It was advocated by private parties with a franchise in view, but this was defeated at the polls, and after two unsuccessful efforts the city finally voted bonds for the municipal project.

The feasibility of the project was patiently explained and exploited by mayor John F. Ford for a number of years before the public became fully aroused as to its desirability. The campaign for the bonds under the auspices of the Commercial Club was an interesting feature of the entire enterprise. The engineers transferred their preliminary plans, estimates and all data to stereopticon slides and these slides were shown at mass meetings previous to the bond election. The slides showed the proposed sites and also pictures of how the dam would look after construction, and with these illustrated lectures given by the engineers, the citizens were enabled to vote intelligently on the project.

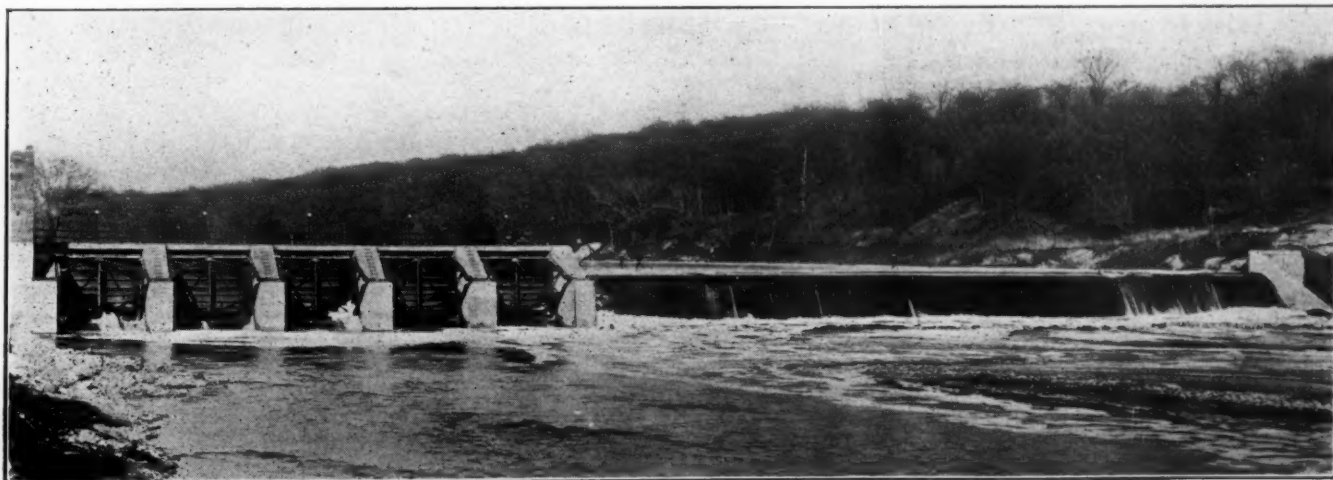
The bond issue for the improvement carried by a large majority, and on the seventeenth of June, 1916, a contract for the construction of the dam was let to the Koss Construction Company of Des Moines, Iowa, and an-

other for the power equipment and machinery installation to the Merkle Machinery Company of Kansas City, Missouri. The difficulty of carrying on the construction work because of the scarcity of materials and labor, together with the handicap of high water and ice, made the whole project one of unusual difficulty.

The spill-way section of the dam is 230 feet long and is of solid concrete construction. The dam has a height of 18 feet above the bed rock of the stream, with a concrete toe 4 feet deep and 3 feet wide on the upstream side. The concrete portion of the entire structure is 412 feet wide, including a concrete fish-ladder at one end as required by the state law of Iowa.

One hundred and thirty feet of the dam consists of five sluice gates of the Tainter type, built of structural steel, with a radius of 17 feet, and arranged so that all five gates may be raised by a motor-propelled electric hoist, allowing the flood stages of the river to pass through the gates, thus avoiding overflowing large areas of land that otherwise would be inundated at flood stages of the river. The raising and lowering of the gates controls the water level above the dam during high water seasons, and also in the winter, and can be manipulated in order to avoid the structure being damaged by ice in the spring.

The concrete spill-way of the dam was finished the 28th of February, 1917; and on March 21st, three weeks afterwards, while the gates were open, a heavy mass of ice came down the river with so much velocity that it tore out the walls of the head-gate chamber and damaged the structure considerably. Before the gates could be closed, large blocks of ice several feet thick passed over



GENERAL VIEW OF FORT DODGE MUNICIPAL DAM.



NEAR VIEW OF GATES AT POWER HOUSE END OF DAM.

the dam and the water on the down-stream side of the dam being low, the ice went over the dam without any cushion of water to break the force of the blocks of ice dropping over the dam. This grinding and hammering effect of the large blocks of ice on the toe of the dam caused a large hole to be scoured out on the down-stream side of the dam. The limestone was fissured and through these fissures in the bed rock streams developed which scoured out a large opening under the dam. Considerable damage was done before the gates could be closed and the water raised so that the water then passed over the crest of the dam and the ice could have a cushion to fall upon as it passed over the structure.

The repairing of the hole under the dam was accomplished by driving steel sheeting on the up-stream side of the dam and building a coffer-dam on the down-stream side of the dam. The hole, which was about sixty feet in length and large enough for a man to walk through, was poured full of concrete and a reinforced concrete apron was constructed on the down-stream side of the dam. The solid concrete dam for several months formed a perfect arch over the hole under the dam before repairs could be completed. The high-water stage of the river came and passed before the repairs could be completed, thus adding another danger in carrying out the construction work. The entire repairs were finally finished on December 14, 1917, and the plant was tested out and accepted by the city on March 1, 1918. The total cost of the project, including power house, turbine, generator and transmission line, was approximately \$130,000. Careful examination showed the original structure to be of excellent construction, and the fact that the dam for a stretch of sixty feet from side to side over the opening, containing three and one-half million pounds of concrete, withstood the strain seems to be ample evidence that there was nothing faulty about the concrete work.

The power house is of brick and reinforced concrete construction, fifty-six feet long and twenty-two and one-half feet inside width. One five-hundred-horsepower vertical turbine of the Francis type was installed and foundations are already built for a second unit, which will be installed later, and thus give a total development of one thousand horsepower. The power is transmitted to the water works station about three-quarters of a mile below the dam and used for pumping the water. Since placing the plant in operation the city has accomplished a saving of approximately \$40 per day on fuel alone. Arrangements are being made for selling the surplus power, as there is a good demand for the power at a number of mills and factories close by.

The lake formed by the backing up of the water is about eight miles in length and will average five hundred to six hundred feet in width. The wooded hills on each side of the stream and high bluffs at various points add to the attractiveness of the lake, and it is believed that the spot will prove especially attractive, not only to the citizens of Fort Dodge, but also to surrounding communities who heretofore have been compelled to travel hundreds of miles to visit any recreation spot.

The design and supervision of the work was carried out by Burns & McDonnell as consulting engineers, with Leland C. Angevine as resident engineer in charge of construction, who has since been retained by the city and placed in charge of the operation of the municipal power plant.

PAVING OVERFLOWED ROADS.

Shelby County, Ind., last year laid about 14 miles of gravel roads, and included in the contract about 600 square yards of concrete pavement, 1-2-3 mix. The object of providing this comparatively small amount of concrete was in order that it could be used in certain low places in the roads which are liable to overflow,



500 HORSEPOWER VERTICAL TURBINE AT FORT DODGE.

which overflow would probably destroy the gravel roads. The entire roadway was graded for a width of 20 feet, while the gravel surfacing was made 14 feet wide and the concrete 12 feet wide. The 14 miles of gravel road, including grading, concrete paving and culvert work, cost about \$42,000.

HAMTRAMCK'S INCINERATOR

Twelve-Ton Plant for Michigan Village—Located in Closely Built-up Section—Details of Operation During First Five Months.

By EARLE L. WATERMAN.*

One of the municipal problems at Hamtramck, Michigan, which became most acute owing to the rapid growth of the village was that of garbage and refuse collection and disposal. This work had been done by contract previous to the summer of 1917 but the results were not satisfactory, so the work was taken over as a part of the municipal program. Special garbage collection wagons were purchased and a 12-ton capacity garbage incinerator was built. The incinerator was completed and put into operation in August, 1917.

Hamtramck, Michigan, is a suburb of Detroit, lying northeast of that city. It forms a part of Hamtramck township, Wayne county, and was incorporated as a village in 1901. The location of several large automobile factories within or near its borders has resulted in a remarkable growth during the last few years. A special government census of the village taken in 1915 shows a population of 21,250 as compared with 3,559 in 1910.

The new garbage and refuse incinerator is located on Tyler Ave., just north of the Michigan Central R. R., in a closely built-up section of the village, only a few minutes' walk from the City Hall. It is a double unit of 12 tons capacity, housed in an attractive building of the bungalow type, 32 feet by 70 feet in plan. The interior walls of the building are of white sand-lime brick and the exterior walls are faced from the water table to the top of the wall with shale mat brick laid in black mortar. The general appearance of the plant is neat and attractive.

There are three distinct divisions in the plan of the building—the charging floor, located in the front end; the furnaces, in the center; and the operating floor and coal bunkers at the rear. The charging floor, arranged on the drive in and drive out plan, is at the same elevation as the top of the furnaces, so that the garbage may be dumped through openings in the floor directly into the incinerating chamber. On arriving at the plant, the load of garbage is first weighed, the liquid is then drawn off and the load moved on to the charging floor into such a position that, when the front end of the wagon is elevated, the garbage will be discharged through the

chute-shaped rear end of the wagon into the incinerator. The wagon and floor are then thoroughly cleaned with hot water. The floor is arranged so that it drains readily through floor drains which are connected to the sewer system. The time elapsing between the arrival of a loaded garbage wagon at the plant and the departure of the same wagon is less than five minutes.

There are two furnaces located in the center of the building, each having a capacity of six tons of mixed garbage and refuse per 24 hours. Each furnace is a complete unit, having a grate 22 inches by 48 inches, located at the right of the combustion chamber and at the same elevation as the floor of the chamber. The combustion chamber is 8 feet 10 inches wide and 12 feet 8 inches long. The arch over this chamber is 38 inches above the floor at the center and 18 inches at the sides. Heat generated at the grate passes out over the garbage, a wedge wall deflecting it in such a way as to cause it to act for a maximum length of time before entering the base of the stack. The stack is 40 feet high and contains two 12-inch flues, one connected to each furnace.

A Hoskin's indicating pyrometer is installed and enables the operator to determine the temperature over the fire box and at the base of the stack in either furnace. Past experience has shown that in the combustion chamber a temperature of at least 1150 degrees of Fahrenheit is necessary to insure complete destruction of the odorous gases which may arise from the burning garbage. It is also desirable that the temperature in the fire box be above a certain point when a fresh charge of garbage is put into the furnace. The indicating pyrometer enables the operator to determine the temperatures which give the best results and should prove of great value in securing efficient and economical operation.

An important feature of this plant is the arrangement made for furnishing a continuous supply of hot water for cleaning purposes. Water from a city service line passes through coils located inside the wedge wall of the furnace and then into a hot-water tank having a capacity of 144 gallons. The heating coil is not in direct contact with the fire and can be removed without interfering with the furnace operation. Steam line rubber hose, connecting with the hot water line, makes it possible to use the hot water at any point on the charging floor.

At the rear of the building and just beyond the firing floor are coal bunkers having a capacity of 100 tons. Wash rooms, lavatory, toilet and locker space are located above the coal bunkers and are reached by a stairway leading up from the firing floor and are connected by a gallery to the charging floor.

The contractor's guarantee was that this plant would consume 12 tons of mixed garbage and refuse per 24 hours with the use of not over 300 pounds of bituminous coal per ton of material destroyed when the plant is being operated at its full capacity and that the plant would operate without creating disagreeable odors. A partial test of the plant, made on August 6th, 1917, satisfied the village authorities that the guarantee had been met and the plant was accepted.

RESULTS OF OPERATION.

Records of the amount of garbage delivered to the plant and the amount of coal used have been kept since October 1, 1917. These data are given in the table on the next page.

It will be noted that during the period for which data are given the amount of garbage collected per month has been decreasing. This may be due to several causes—first, that the amount of garbage is naturally less during the colder months; second, that more garbage is taken care of by the individual householder during the winter months; and, third, that there has been a marked



EXTERIOR VIEW OF HAMTRAMCK INCINERATOR.

*Formerly Assistant State Sanitary Engineer, Michigan State Board of Health.

reduction in the amount of kitchen wastes as a result of the educational campaign of the U. S. Food Administration.

Results of Operation of Hamtramck Incinerating Plant.

Year and Month	Tons of Garbage Collected	Tons of Coal Used	Pounds of Coal Per Ton of Garbage
1917			
October	60.5	9.5	312
November	68.5	13.5	394
December	39.5	7.5	380
1918			
January	38.5	7.5	390
February	34.0	7.0	412

The amount of coal used per ton of garbage during the last five months has averaged 377 pounds, or 26 per cent higher than the contractor's guarantee. This condition must be attributed to the fact that there has not been enough garbage to operate efficiently the one unit in service. It is also to be expected that the frozen garbage collected during the winter months will require more coal for its destruction than that collected during the warmer weather.

The plant operation is under the supervision of the health officer, Dr. X. A. Jones, to whom the writer is indebted for the operation data given above. Dr. Jones reports on operating conditions as follows:

"The plant is kept in a strictly sanitary condition so far as odors and other objectionable features connected with the average incinerating plant are concerned, and we cannot speak too highly of this system of incinerating. We expect to see a marked reduction in coal consumption during the summer months, which will bring our yearly average within the estimate set by the builders."

The Hamtramck incinerating plant was built by Horace Dollarhide of Springfield, Illinois, Michigan agent for the McGuire-Hunter Sanitary Incinerator Co., of Springfield. The contract price for the complete plant was \$14,878.

WATER WORKS OPERATION-DISTRIBUTION SYSTEM.

Importance of Records of Location, Depth, Etc., of Mains and Appurtenances—Map of Distribution System, Detail Records.

A number of years ago there lived in a large New England city a superintendent of water works whose brains contained the sole record of the locations of the mains and valves and other underground features of that city's distribution system. In the natural course of events he died, and that city, after years of investigation, still wonders whether it has yet learned the location of all of its valves and mains.

We do not believe that this particular superintendent refrained from keeping records of these matters with the idea of making himself so invaluable that the city's officials would not dare to discharge him; but where such condition is permitted to exist, an advantage of this kind may well be taken by an unscrupulous superintendent. For example, Municipal Journal described, a few years ago, a condition of affairs in a western city in which a water works superintendent and his assistants, who were removed from office by an incoming administration, claimed that all of the records of the office were their private property inasmuch as the keeping of such records was not one of their prescribed duties, and took all such records with them and refused to surrender them. In this emergency the new administration apparently admitted its doubt as to the legal rights of the city in the matter by failing to prosecute the ex-superintendent, but instead placed an extra force at work for a few

weeks determining the location of the various features of the distribution system.

Even mental or personal-property records of locations are better than no knowledge at all. The writer, when laying out a sewer in a certain New York State city some years ago, was informed by the water works superintendent that he knew the water main was on the east side of the street, for he always laid the main as near the curb as possible and on the side of the street on which the first house therein was built. When the sewer trench was excavated in this block, the water main was found running diagonally from the eastern side at one end of it to the western side at the other end, the reason for this location apparently being that the second house on the block was located on the western side and the main was located as nearly as possible on a straight line from one house to the other, presumably to permit using the minimum length of service pipe.

These three illustrations, cited as they occurred to the writer, illustrate some of the reasons why written, official records of all underground features of a distribution system are most important for the proper and economical operation and maintenance of the system and can hardly fail to be worth many times their cost. In fact, the cost is merely nominal if the records are kept up to date, since this means merely recording in a pocket notebook, at the time of construction, the location and other details of each pipe or appurtenance set, and copying these into the official record book on rainy days or at other times when opportunity permits.

A superintendent who wishes to save himself future annoyance; to make possible the systematizing of his work, and to perform his duties in the manner most serviceable to the city, should make it his first business upon taking charge of a water works system, whether new or old, to make sure that there are on record in the office all the essential items of information concerning all features of the distribution system; and if such are not to be found recorded in sufficient completeness, the making or perfecting of such records should be one of his first duties. The situation is analogous to that of a superintendent of a factory or large business, who cannot properly perform his duties until he has on hand an inventory of all the machinery, materials, goods and other property over which he has control. If the city ordinances, the company's rules and regulations, or the contract under which the superintendent serves, do not distinctly specify that the keeping of such records is a part of his duty, such provision should immediately be made; and in the meantime professional ethics should dictate that the keeping of such records is the moral duty of every superintendent, even though it may not be the legal one.

MAPS OF DISTRIBUTION SYSTEM.

The permanent records should include a large map (generally a wall map) on which are indicated by lines the extent of the distribution mains, the size of each main being indicated either by colors, by combinations of dots and dashes, or by figures. The first has the objection that if many different sizes are used and the number of colors used becomes great, there may be difficulty in distinguishing between them, especially if they have faded out. Almost any number of sizes in commercial practice may be indicated by combinations of dots and dashes, the use of 1, 2 or 3 dots with 1, 2 or 3 dashes permitting eleven combinations. Such a system requires, of course, careful explanation in a "legend" on the map, which must be added to from time to time as new sizes are laid. The use of figures on each pipe line permits reading directly without reference to the

"legend" and eliminates the necessity of counting the number of dots and dashes and the possibility of error on the part of the draftsman in drawing the line. There seems to be little objection to this practice, except that the map does not present quite so good an appearance.

In addition to the mains that are laid, this map generally shows also the location of each fire hydrant and each valve. In some cases proposed extensions of the system also are indicated, either in pencil or in inked lines and figures made much lighter than those indicating constructed mains.

For simplicity in keeping records of hydrants and valves and insuring that every one is accounted for and none is counted twice, it is desirable to give each hydrant and each valve a number. One reason for this is that both hydrants and valves are commonly placed at street intersections, and consequently might readily be recorded twice, once in summing up the appurtenances on each of the intersecting streets. Given a city one mile square laid out on the rectangular system with blocks measuring 350 feet on each side from centre to centre of street, and if mains are laid in all streets, such a city would contain thirty miles of mains, and if there be one fire hydrant for each 500 feet of main, as is a common average, we would have in this city 317 fire hydrants. In cities adequately provided with valves, the number of these will ordinarily be from two to four times that of the number of hydrants. It is apparent, therefore, that even in a comparatively small city the number of these fixtures is so great that some may be overlooked in the records unless some systematic method of recording them is adopted.

It will aid considerably in locating valves and hydrants by their numbers if a system be adopted for allotting these. For instance, coordinates may be drawn through the centre of the city and all hydrants or valves in the northeast quadrant may have numbers ranging from 0 to 199, those in the southeast from 200 to 399, those in the southwest from 400 to 599, and those in the northwest from 600 to 799. In addition, the first hundred in each quadrant may lie in a strip running east and west and extend for a certain distance above or below the east and west coordinates. The second hundred would lie within a second strip of approximately the same width and parallel and adjacent to the first. For a city which is or promises to be large, it may be desirable to allot more than 200 to a quadrant; or when the number in any quadrant or in any hundreds strip reaches its limit, all limits may be increased ten fold, giving 2,000 to each quadrant in the above illustration.

DETAIL RECORDS.

This large map, on which are indicated the general locations of mains with their sizes, of fire hydrants and of valves, is the most essential record of the distribution system, but it should not be the only one. Not only should the superintendent know what size of main is laid in a given street, but he should also know exactly its depth below grade, its location with reference to the centre or side line of the street, and the exact location of every plugged T or other special left in the line for making future extensions. It is also desirable that he know the date at which the pipe was laid, the foundry from which it was obtained and the name of the contractor or other party who laid it. Also, for the benefit of his successor (and all superintendents must die some time, even though they retain their positions during their lifetime) and even for his own later information, it is desirable to keep a record of the history of each main—leaks or breaks which may develop, repairs made, etc. There should also be recorded the exact location of each service tap made in the main, and the

kind of service pipe, goose neck, make of curb-cock, etc., to be entered immediately after the construction of the service. All of these locations and dimensions can be indicated more concisely and definitely by a diagram than by any amount of descriptive matter; and the records should therefore preferably consist of a diagram giving the required dimensions, together with such written description as is necessary to describe the kind and make, the material used, date constructed, name of property owner, name of plumber doing work, etc.

It is too often assumed that the location of valves is sufficiently indicated by the valve box in the street surface. In the first place, the difference between being able to find a valve by going on the ground and looking for it (which may involve shoveling snow off the entire street intersection), and knowing beforehand just where to find the valve and going directly to it, may represent thousands of dollars of loss to property in case of a broken main if the valve can be located and closed in one minute instead of in five to thirty minutes. Moreover, without a diagram showing the location of all valves, it may not be possible to know just which one it is necessary to close in an emergency or where it is best to locate new valves in making extensions; or in general to study a given system and assure oneself of the adequacy of control furnished by the valves.

In the great majority of cases, valves are located at street intersections and it is generally sufficient to place on the records diagrams of such intersections; valves located elsewhere being indicated by special drawings. Since fire hydrants also are commonly located at street intersections, it would economize in records to use the same ones for indicating the positions of both valves and hydrants. As in the case of mains, diagrams can be used most conveniently to show locations and dimensions, while accompanying descriptive matter gives the other information. Concerning valves, the records should give for each the number allotted to it; the size by which it is designated; name of maker; year set; depth below street surface; location with reference to curb corner, property line, or other well-defined object or line in the street; the direction in which it must be turned to open (generally designated as right-hand when turned clockwise and left-hand when turned counterclockwise), and the number of turns required to open or close it.

Of fire hydrants, the records should give the allotted number; size by which it is commercially designated; the depth of the connection below the surface; whether there is a valve in this connection and if so its location with reference to the hydrant; how drainage of the hydrant is effected (whether by drain-pipe to the sewer, by broken stone placed around the hydrant, etc.); direction of turning to open and number of turns, name of maker, and year set.

In the case of both valves and hydrants, all should open by turning in the same direction. Absence of such uniformity has resulted in twisting off the stem, failure to close or open a valve in an emergency, and many other unfortunate and costly mishaps; in spite of which, a number of cities have in service valves opening in both directions.

All of the above information concerning mains, valves and hydrants should be obtained when these are laid, for at that time the obtaining of this information is a matter of no difficulty and little trouble. If, however, such information was not recorded at that time and must be obtained later, much can be done at no great expense. In the case of fire hydrants, these of course can be found without difficulty and the size of barrel determined. The depth of service pipe can be learned by taking off the bonnet of the hydrant or by dropping a

CLEANING MAINS, LEAKAGE AND METERS.

City and state	Do mains need cleaning at intervals?	Method of cleaning	Methods of detecting and pre- venting leakage and waste	Is leakage enough to make radi- cal action desirable?	Percentage of services metered	Owner of meters*
Alabama:						
Gadsden	No	.....	Check meter readings with pump readings	No	100	City
Talladega	No	.....	Inspecting fixtures	No	90	City
Arizona:						
Nogales .....	....	.....	.....	....	95	City
Arkansas:						
Eldorado	Yes	Flushing	None	Think not	60	Company
California:						
Anaheim	Dead ends	Flushing	.....	....	100	City
Glendale	No	.....	None	No	100	City
Los Angeles	No	.....	Leaks come to surface	No	95	City
Oxnard	No	.....	Leakage comes to surface	No	7 meters	City
Pacific Grove	No	.....	.....	No	100	Company
Redlands .....	.....	Flushing	Sonoscope	No	60	City
Riverside	No	.....	Aquaphone	No	12	City
Santa Maria	Yes	Replacing	Compare pumping and con- sumption	No	75	City
Stockton	Yes	Flushing	Pitometer	No	17	Company
Colorado:						
Ft. Morgan	No	.....	Inspection	No	1.9	City
Colorado Springs..	No	Not cleaned	Inspection	No	2	Consumer
Longmont	Yes	Not cleaned	Leaks come to surface	No	6	Both
Connecticut:						
Ansonia	Probably	Never cleaned	Meters	No	....	Company
Bristol	No	Not cleaned	.....	Think not	86	City
E. Hartford	No	.....	Leaks come to surface	No	3	City
Middletown	Yes	Flushing	Inspection and aquaphone	No	99	City
New London .....	.....	.....	Meters	Yes	54	City
S. Manchester	Do now	Not done	Most come to surface	....	100	Company
Southington	Wrot iron do	Renew with larger	Meters and inspection	No	10	City
Suffield	No	.....	None	No	100	Company
Wallingford	No	.....	Inspection	No	18	City
Willimantic	No	.....	Leak locator	No	90	City
Windsor Fire Dist.	Yes	Flushing	House inspection	No	8.4	City
Florida:						
Daytona	Yes	Flushing	House inspection	No	100	City
DeLand	No	.....	Sonoscope	No	95	City
Ft. Myers	No	.....	.....	No	95	City
Orlando	Yes	Water power turbine cleaner	Inspection	No	10	Company
St. Augustine	Yes	By contract	Darley leak finder	No	50	City
Georgia:						
Americus	No	.....	Observation	No	100	Consumer
Atlanta	No	.....	Rigid inspection	No	100	City
Lagrange	No	.....	Inspection	No	100	City
Milledgeville	No	.....	None	No	66	Company
Thomasville	No	.....	Leak locator	....	100	City ^d
Tifton	Yes	Flushing	No	No	100	Consumer
Waynesboro	No	.....	.....	No	90	City
Idaho:						
Boise	No	.....	Surface indications	No	95	Company
Lewiston	No	Flushing	House inspection and sur- face indications	No	70	City
Twin Falls	No	.....	.....	No	0.1	City
Weiser	No	.....	House inspection and sur- face indications	No	100	City
Illinois:						
Bloomington	Yes	Flushing	Measure pumpage	No	100	Consumer
Champaign	No	.....	Inspection	No	90	Consumer
Downers Grove ...	No	Flushing	House inspection	No	100	Consumer
Flora	No	.....	.....	No	90	City
Freeport	No	.....	.....	No	90	Company
Lake Forest	No	.....	Monthly inspection	No	100	Both
Marshall	No	.....	None	Yes	2	Consumer
Mt. Vernon	Yes	By contract	Aquaphone	No	90	Company
Mendota	Yes	Flushing	Meters	....	100	Company
Paris	No	.....	Leak detector	No	20	City
Peru	No	.....	Recording gauge	No	100	Consumer
Quincy	No	Not cleaned	Surface inspection	No	70	City
Rock Island .....	....	Flushing	Inspection	.....	.....	.....
Watseka	Yes	Flushing	Meters	No	33	City
			None	Yes	100	City
Indiana:						
Bedford	Yes	Flushing	.....	No	2	City
Brookville	Yes	Flushing	None	No	0.03	Both
Delphi	No	.....	Inspection and meters	No	65	City
Elwood	Yes	Flushing	.....	No	70	Company
Ft. Wayne	Yes	Flushing	None	No	100	Consumer
Goshen	No	Flushing	None	No	70	City
Knightstown .....	.....	Not done	Meters	No	100	City
La Porte	Yes	Flushing	Inspection	No	9	City
Lebanon .....	.....	Flushing	None	No	76	City
Linton .....	.....	Flushing	Surface indications	No	15	Company
Mishawaka	No	.....	.....	No	100	City
No. Manchester ...	Dead ends	Flushing	None	No	95	City
Peru	Yes	Flushing	Inspection	No	5	City
Plymouth	No	.....	Surface indications	No	100	City
Terre Haute	No	Flushing	.....	No	94	Company
Tipton	Yes	Flushing	Meters	No	95	City
Vincennes	No	None	None	Think not	30	Company

d—Meters owned by consumer until 1912, by city since 1912.

METERS. RATES. MUNICIPAL USE.

City and state	Is deposit on meter required?	Is rental charged for meters? ^f	Does city obtain water without payment?	Use made of free water	Percentage	Used for Municipal Purposes Is any of it metered?
Alabama:						
Gadsden	Yes	No	Yes	Schools, buildings, flushing streets and sewers	20	All city buildings
Talladega	Not usually	.....	Yes	Street sprinkling, schools, public buildings, fountains, flushing sewers	60	No
Arizona:						
Nogales	Some cases	No	No	.....	.....	No
Arkansas:						
Eldorado	New property owners	No	No	.....	.....	No
California:						
Anaheim	\$10 ^a	No	Yes	.....	2	No
Glendale	By tenants	.....	No	.....	None	.....
Los Angeles .....	.....	No	Yes	All municipal uses	20	No longer
Oxnard	No	No ^a	Yes	Sprinkling, street flushing, parks, city buildings, etc.	.....	No
Pacific Grove	No	No	No	.....	.....	.....
Redlands	No	No	No	Fire	3	Yes
Riverside	No	No	No	.....	.....	Yes
Santa Maria	No	Minimum rate	No	.....	.....	.....
Stockton	Yes	Minimum charge	No	.....	7	All
Colorado:						
Ft. Morgan	No	No	Yes	Park, public, buildings, fire	.....	No
Colorado Springs .....	.....	.....	Yes	All purposes	40	.....
Longmont	No	No	Yes	Parks, city buildings, etc.	5 ^b	No
Connecticut:						
Ansonia	No	Minimum charge	Yes	Watering troughs	.....	All except street and sewer flushing
Bristol .....	.....	For secondary meters	No	.....	.....	.....
E. Hartford	No	No	No	.....	.....	.....
Middletown	No	Minimum charge	Yes	Street sprinkling and fires	10	No
New London	No	Yes	Yes	All purposes	.....	.....
S. Manchester	No	Minimum charge	Yes	Hydrants	4	All but hydrants
Southington	No	Yes	No	.....	.....	All
Suffield	Tenants only	Minimum charge	No	.....	.....	Schools and fountains
Wallingford .....	.....	.....	Yes	Sprinkling and fire	.....	Schools and public buildings
Willimantic	No	No	No	.....	.....	All but street and sewer flushing
Windsor Fire Dist.	No	No	No	.....	2	All
Florida:						
Daytona	\$5	\$5 ^c	Yes	Fire	5.5	All metered
DeLand	No	\$3	No	.....	1/2 or more	No
Ft. Myers .....	.....	No	No	.....	200,000 gal.	Yes
Orlando	Sometimes	No	Yes	Schools, bldgs., sewers, etc.	.....	No
St. Augustine	No	No	Yes	Fire	15	Yes
Georgia:						
Americus .....	.....	.....	Yes	Sewers, Charity, etc.	25	Yes
Atlanta	No	No	Yes	All municipal uses	17	All
Lagrange	No	No	No	.....	2	All
Milledgeville	No	No	Yes	Flushing sewers, public buildings and fountains	2	All
Thomasville	No	No	Yes	Street sprinkling, public building, hospitals, etc.	7	All schools
Tifton .....	.....	.....	Yes	Fire and public buildings	5	No
Waynesboro	No	\$3	No	.....	5	All
Idaho:						
Boise	No	No	No	.....	2	All buildings
Lewiston	No	No	Yes	Sewers, streets, public buildings, parks, etc.	40	No
Twin Falls	Yes	No	No	.....	2	No
Weiser	Yes	.....	Yes	Fountains, schools and fire	25	One-half
Illinois:						
Bloomington .....	.....	.....	.....	Fountains, flushing streets and sewers	.....	.....
Champaign .....	.....	.....	Yes	Buildings and fountains	Small	No
Downers Grove .....	.....	.....	Yes	Buildings and fountains	.....	No
Flora	Yes	No	Yes	City Hall and sprinkling streets	.....	No
Freeport	Yes	No	.....	.....	.....	Schools
Lake Forest	No	Yes	Yes	Schools, buildings, sewers, fountains, etc.	.....	Yes
Marshall .....	.....	.....	Yes	Boilers and fire	1	No
Mt. Vernon	If credit is poor	No	No	.....	5	Schools
Mendota .....	.....	.....	Yes	Fire, sewers, sprinkling, fountains	.....	15 to 20%
Paris .....	.....	.....	No	.....	Very small	No
Peru	No	Minimum charge	Yes	Bldgs., schools and hospitals	.....	All
Quincy	Non-owners	No	Yes	City Hall, engine houses, parks and hospitals	5	Schools, hospitals, parks
Rock Island	No	Sometimes ^a	.....	.....	.....	No
Watseka	Yes	No	Yes	City Hall, library, fountains	.....	No
Indiana:						
Bedford	No	No	No	.....	Very small	No
Brookville	No	No	Yes	Schools, City Hall and fountain	.....	No
Delphi	No	No	Yes	School, library, fountains	10	No
Elwood	Yes	No	Yes	Churches, schools, city buildings, flushing streets and sewers, fountains and fire	.....	No
Ft. Wayne .....	.....	.....	Yes	All city purposes	30	No
Goshen	No	No	No	.....	.....	5%
Knightstown	Yes	No	No	.....	.....	No
La Porte	No	No	.....	.....	5	In buildings
Lebanon	\$2	No	No	.....	5	In schools
Linton	No	No	Yes	Flushing sewers	.....	All but sewers
Mishawaka	Yes	No	Yes	Streets and flush tanks	20	Schools
No. Manchester	Yes	No	No	.....	25 ^b	Schools
Peru .....	.....	\$6	No	.....	10	No
Plymouth	No	Minimum charge	Yes	Street sprinkling, sewer flushing, fountains and fire	10 ^b	No
Terre Haute	Non-owners	No	No	.....	.....	Yes
Tipton	No	Minimum charge	Yes	Public utilities	.....	Schools
Vincennes	Yes	Yes	No	.....	.....	All

a—Refunded in water; b—estimated; c—readiness-to-serve charge; e—rental charged when bill is less than \$9 per annum.

plumb line into the barrel through a nozzle. Whether the hydrant connection is provided with a valve can ordinarily be learned only by finding the valve box, if necessary by digging a shallow trench from the hydrant toward the main, since in some instances of dirt or macadamized roads the valve box is pushed out of sight, when the ground is wet and soft, by the weight of wheels passing over it, and is later covered by dirt or stone and its presence forgotten. Cases are even known where a new pavement has been laid entirely covering such valve boxes, their presence not having been known.

The obtaining of information concerning valves is more difficult. If the street has been paved it must generally be assumed that all valve boxes show in the pavement surface; and yet the writer has found valves entirely covered with pavement and the presence of the valve unsuspected until a leak around the valve stem that showed on the surface caused an excavation to be made at this point. Having found a valve box, by removing the cover (and cleaning the dirt out of the valve box, if necessary) it is possible to measure the depth from the surface to the top of the pipe in which the valve is set. In some cases a pair of calipers may be used shaped like a pair of tongs and the outside diameter of the pipe measured; or the depth to the pipe and that to the top of the bonnet may be compared, giving the height of the bonnet, and a comparison with valves of different sizes in the stock room will generally enable one to determine from this the size of the valve. By the use of the wrench it may then be determined in what direction the valve turns to open, and the number of turns can usually be determined also. In case the stem cannot be turned easily, the valve needs attention anyhow (a valve that will not operate is worse than no valve at all), and should be dug down to and put in order; in which case all of the information desired, including the name of the maker, can be obtained.

In keeping the records, these may be placed in an ordinary notebook, each street being followed out consecutively from one end to the other; or a system of cards can be used, one card for each street intersection, filed in an ordinary card index; or the records may be kept in a loose-leaf ledger. The writer prefers the last named, since it permits adding new records and keeping all in order according to any desired system; with the additional advantage of considerably larger space which permits the recording of all information so as to be read easily and offers no excuse for the omitting of any details because of lack of room. Another minor disadvantage of the card index is that a card is frequently removed in

order to copy information from it and a careless assistant may fail to return it to its proper position. There is, however, the advantage of the card index that in the case of a large city the loose-leaf records would occupy a large amount of filing space, and such records are more likely to be left out of the fireproof vault than would be the case with a card index which is always kept under fireproof conditions.

PROSPECT OF TRAFFIC IMPROVEMENT.

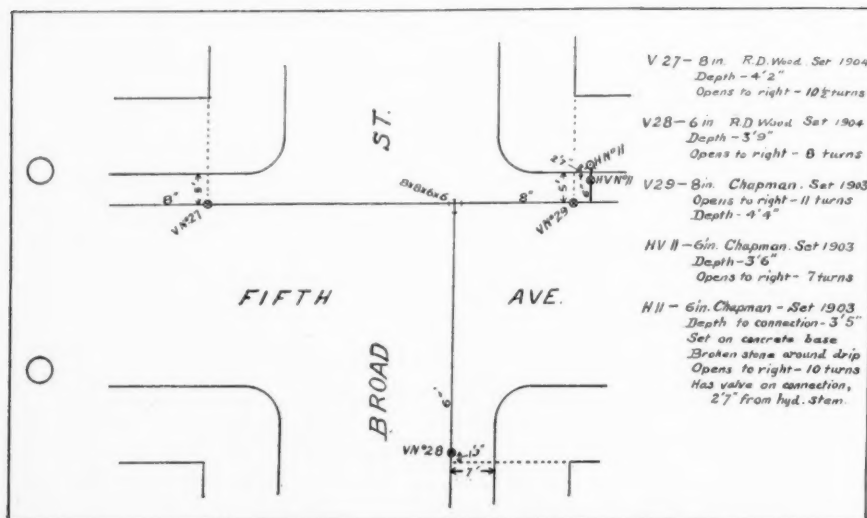
A few days ago Director General McAdoo placed orders for 70,000 freight cars, this being in addition to an order for 30,000 given a short time previous. About one-third of these are to be gondolas, which is the type of car used commonly for most road and other structural materials. This should help considerably in preventing car shortage next fall and winter; and a proportionate increase in locomotives will add to the relief. All of these will not, of course, be net gain, since numbers of both cars and locomotives are worn out and scrapped each year, and the number will probably be greater this year than ever because of the greater amount of traffic and other unusual conditions. The increase renders it probable, however, that traffic next winter will be limited by terminal facilities rather than by rolling stock.

Meantime conditions seem to be improving slowly, chiefly along the lines of deciding what services are most deserving of preference in the handling of freight. But there remains, and probably will continue to remain for months to come, urgent necessity for the maximum possible assistance by motor trucks using the highways.

RETURN LOADS IN NEW JERSEY.

We are informed by James Logan, president of the New Jersey Association of County Engineers, that at a special meeting on April 29th that association authorized him to appoint a "return loads" committee, which will meet weekly with other committees in connection with return loads and other motor-hauling matters, the meetings being held in Newark. President Logan appointed as this committee Garwood Ferguson, of Passaic county, chairman; J. L. Bauer, of Union county, and Ross McCave, of Bergen county.

The aim of the association, acting through this committee, is "to do its utmost by cooperation to relieve the present congested conditions in the vicinity of Philadelphia, New York City, etc."



Sample page of a loose-leaf Valve and Hydrant record book (one-third actual size). Each sheet gives the location and description of all valves, hydrants and specials at one street intersection. The other side of the sheet is ruled, and on it is written a history of this part of the distribution system—repairs made to valves and hydrants, renewals, etc.

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Municipal Journal's Information Bureau, developed by twenty-one years' research and practical experience in its special field, is at the command of our subscribers at all times and without charge.

KEEPING MAIN HIGHWAYS OPEN.

Prominent recognition has been made of the work done by the Pennsylvania Highway Department last winter, in the form of a letter to commissioner J. Denny O'Neil from the Lincoln Highway Association, which it wrote to "express, as representing in a small way public opinion at large, our admiration of the public-spirited, patriotic efforts concentrated by your department upon the Lincoln Highway, in accordance with the request of the Council of National Defense and the Highways Transport Committee of that body, in keeping Pennsylvania's broad section of this main line of transcontinental motor traffic continuously open for the through passage of freight, both governmental and private. It would be difficult to estimate the measure of relief afforded our overburdened railways during the past winter through the transportation by motor truck of the thousands of tons of commodities which have moved across Pennsylvania." The work done by this state in snow removal we have already described.

Snow removal may seem an untimely subject just now; but on the other hand, the obtaining of funds for next winter's snow fighting is very timely, since the annual appropriations or allotments are being or have recently been made, and it is not too early—it may be too late—to obtain an adequate amount for next winter's work. But snow is not the only obstacle to traffic to be fought, and the intensive use of the main highways by motor truck traffic may be just as disastrously interfered with by wear as by snow drifts. State and county highway authorities have on hand a most important and perhaps difficult problem in keeping highways in good condition under the combination of unprecedented use and

high cost and scarcity of labor and materials; but no duty has ever been more urgent or essential, and we believe that they will do it to the utmost of their ability—that they will find some way, even though present conditions make it appear impossible.

MAINTAINING WATER WORKS PROPERTIES.

Some municipal water works are decided successes, most of them give satisfactory service, but a few fall far short of what such a public utility should be and may be called failures even though they continue to operate. The same may be said of privately operated plants. Some of the causes of failures are suggested by the following letter received by us from the superintendent of a municipal plant in a western city:

No man ever holds but two years, often but one, and sometimes gets disgusted and quits before one year is finished. Water system in 12 to 15 years; no system for repairing, testing or proving meters; if one stops going or is frozen up some plumber gets it, cleans and fixes it, blows in it and if it goes round puts it back and charges all the customer will stand. After being in a short time I have for two years urged the city to have their work properly done. I also want the city to divide the system into districts of not over four blocks, examine and test all gates; if none where one is needed, put one in; prepare for cleaning pipes if they need it after a thorough examination. Make a complete record showing location of all pipes, size and kind; all connections, size and kind; location of all valves of any kind, and all stop boxes for private systems, with a better system for location of meters. Put all pipes below freezing. To make a connection of large size or put in new hydrants in the greater part of the city, we must shut water off all over the city.

This city apparently has no real system, only some pipes with a few valves poorly placed. It has no records of what there is under ground, and as there have been a number of superintendents in rapid succession, it would be strange if any one now possesses such information. False economy in original construction and a continuation of the policy in the maintenance are indicated by scarcity of valves and failure to test the few in service. If the mains are gradually choking up and the valves are unserviceable, no one knows it. It may be expected that some day the city will wake up with a jolt to find that its system has failed it in an emergency—as in case of a large fire—and is fit only for the scrap pile.

A passenger steamer does not often need lifeboats and life preservers, but none is allowed to be without them, and every little while a catastrophe arouses inspectors and companies to a new realization of the necessity of keeping them in serviceable condition. Similarly, valves in a distribution system are not often needed, some may never be, but when they are wanted they are wanted badly and instantly, and they should not only be present in the system, but their exact location should be known and they should be in good working order. There should therefore be a readily-consulted record of them, and they should be tested at intervals to insure that they will be ready for service when wanted. In too many cities there are neither records nor systematic tests.

This is but one of the features of proper maintenance of water works properties. Others pertain to care of fire hydrants, pumping machinery, standpipes, reservoirs, purification plants, meters, etc. Superintendents should be supported and encouraged by water boards or directors in keeping the entire property keyed up to a high degree of efficiency; in fact, they should be required to do so. Periodical inspection, testing and overhauling should be considered an essential part of their duties; and the money for necessary up-keep should be provided even if it necessitates postponing extensions.

SEWER PIPE OBTAINABLE.

In our issue of April 13th we published a statement concerning the restriction by the government on the output of sewer pipe manufacturers, in which this restriction was said to be 50 per cent of the normal output. This information was received from a source which we considered reliable, but we have since learned that this was not the final decision of the administration. The director of conservation informs us that United States Fuel Administrator Garfield has made a definite ruling covering all vitrified clay, cement, or concrete sanitary sewer or culvert pipe, in sizes 42 inches in diameter or over, all drain tile and flue linings, that no manufacturer shall use fuel of any description in connection with the manufacture of such products to an amount exceeding 75 per cent of the average amount consumed at such plant for those purposes during the years 1915, 1916 and 1917; except that individual manufacturers may obtain permission for a larger production from the fuel administration should it deem it desirable to grant it on the ground that the necessities of the government require such greater production, or in case the fuel administrator of the state certifies that the additional amount of material is required in connection with building operations of urgent public necessity.

It does not seem probable that this restriction will in any way interfere with the carrying out of any contemplated projects this year, since it does not seem probable that such projects will be proposed exceeding in amount 75 per cent of normal years. Moreover, it is quite possible that it will be difficult to obtain transportation facilities for even this amount, and it is probable that if there should be any restrictions upon the amount of pipe that the cities of the country can obtain for use this year, such restriction will be imposed by the limitations of the transportation facilities of the country and not by those placed on the manufacturers.

TURNING GARBAGE INTO DOLLARS.

Advantages of Hog Raising—Answering Objections to Garbage Feeding—Cost of Plant—Proper Location and Care Necessary.

The Extension Division of the University of Wisconsin has issued a bulletin on the utilization of garbage, in which it urges all communities in that state to make unusual effort to collect all of the garbage from the homes of its citizens and to use it in the raising of pigs. An increase in the amount of pork raised in the country would be a most important factor in the solution of the food problem; but, aside from this, there would seem to be opportunities for considerable profit from the raising of swine. Says the bulletin referred to: "Hogs are quoted at \$17.50 per hundred pounds on foot at present, so that a gain of 200 pounds represents a saving of \$35 per hog as fed on the garbage produced by forty-five people."

"The consensus of opinion among unbiased sanitary engineers and garbage disposal experts is that garbage can be and is being fed in a sanitary manner, without danger to public health and at a very distinct profit." In average times, the garbage from 50 people is sufficient to fatten one hog each five months. Assuming that food conservation has reduced the amount of garbage by 50 percent, we have one hog fattened to a value of \$35 for every hundred people in the community.

The bulletin summarizes much of the information

which has previously appeared in the Municipal Journal concerning the raising of hogs, and in addition discusses objections that have been raised to it and suggestions for carrying out the plan, which are quoted herewith.

"Objections to Garbage Feeding. The feeding of garbage has been unduly condemned for the following reasons:

"(a) There is a popular belief that the feeding of garbage endangers the public health. This belief is not founded on the facts. It should be stated that, contrary to popular belief, human diseases are in all probability not transmitted through garbage feeding. The sanitary problem, then, concerns not so much the health of man as the health of the hog.

"(b) Garbage feeding plants have in the past been pretty generally mismanaged from a sanitary standpoint, but the system should not be condemned on this account. Garbage feeding plants can be made sanitary. Many cities in the United States are now successfully feeding garbage to swine without injury to the public health. More than 90 per cent of all the hogs raised in the State of Massachusetts are garbage fed, and the Massachusetts State Board of Health is most efficient, at all times demanding the best results.

"(c) The hog has been generally condemned as a filth-loving animal. This is far from fair to the hog who is naturally a tidy animal. Owing to the fact that a hog perspires only on a very few spots on his body and that he is overfed to force fattening, quite naturally he becomes hot and seeks the handiest place available to cool off. If the proper place is provided for wallowing, and plenty of shade is at hand, the hog will keep clean. It is true that the conditions under which some pigs have been fed and fattened have been not only a disgrace to the community but decidedly unfair to the hog.

"(d) Complaints of the bad odors have been made against garbage feeding piggeries, yet where proper precautions are taken there is no more objection to feeding garbage than to feeding grain or other hog food.

"Cost of Plant. The cost of establishing a piggery and conducting it on a scientific basis depends so primarily upon local conditions that even generalities and estimated costs are of little value. However, a fully equipped and properly constructed plant for 500 hogs can be built for about \$4,000.

"Caution. Any municipality or individual who plans to utilize garbage in the feeding of hogs must constantly bear in mind that to maintain an establishment of this kind without creating a nuisance, the plant must first be properly located, and secondly, properly cared for at all times.

"The state law provides that whenever a nuisance shall be found on private or public property, it must be abated. The State Board of Health and the local boards of health have full authority to abate such nuisances.

"Therefore if the feeding of garbage is undertaken, it must be done in a proper location and under adequate supervision at all times. The services of an expert should be sought in every case when new plants are installed. There are many garbage-feeding plants throughout the state which are conducted in such a manner as to raise no objection whatever, whereas in a number of other localities it has been necessary to order the business discontinued on account of the nuisance created.

"Selling Garbage. In many cases it will no doubt be better to sell the garbage direct to licensed farmers. This can be arranged by the city making its own collections and hauling the garbage to a conveniently located transfer or loading bin. The loading station should be

so designed as to make it possible to keep it in a sanitary condition and to make loading and unloading economical. An attendant should be in charge of the loading station at all times so that a record of the garbage sold may be properly kept. He should be held responsible for the sanitary conditions at the transfer station.

"This plan will be especially effective in the solution of the garbage problem of the smaller cities, and in fact a plan worthy of consideration in most cities, since it can be quickly and cheaply installed and does not demand the services of experts who are most essential in the effective operation of a community piggery.

"Where to Feed. The garbage feeding should be carried on either at a well located piggery outside the city limits and on land suited to the purpose or on certain farms outside the city limits. It is not intended to convey the idea that the "keep a hog" idea is urged on the town people. Nothing could be further from the purpose of this bulletin. Hogs in no case should be fed inside the city limits, and where fed outside the city limits the stations should be so located and conducted as to prevent complaints."

IRRIGATING WITH SEWAGE AT TUCSON.

Nearly Five Hundred Acres of Arid Farm Land Can Be Watered—Seventeen Years of Experience By the City.

By W. C. LEFEBVRE.*

After approximately seventeen years of more or less experimentation, Tucson, Arizona, located in the midst of an arid desert, this year will be able to water four hundred and eighty-three acres of surrounding farm land through the use of its sewage water and reap a financial reward from the sale of the water of about \$10 per acre per year.

The sewage water is practically clear and little or no odor comes from the land. The land may be sowed any number of times during a year. It does not wear out, but continually improves, as the experience of seventeen years has shown.

All of the lands receiving the water will, of course, be developed to forage crops. Results have shown that it is possible to produce seven tons of alfalfa to the acre (five crops), sorghum four tons per acre, barley hay, three tons.

The price of the water service is fixed by the city ordinance at a minimum of three dollars per acre a year, since there would be six irrigations per year at least.

Of the total area that can be irrigated, 108 acres will be owned by the city and operated as a city farm for the production of feed for the market and for the city stock. This leaves 375 acres under private ownership that can be taken in on irrigation.

It was about seventeen years ago that Tucson first paid heed to the dry farmers of the district and began the practice of using sewage for irrigation, on ten acres of city farm land. The farmers received none of the benefit, but the city did. From that time up to the present the system progressed irregularly until there are now one hundred and thirty-six acres of city land under irrigation.

In its collection of sewage, Tucson uses the "separate system," that is, a system which carries house sewage only. Up to the first of January, 1918, the city had

sixteen miles of lateral sewers. The sewage collected by these was used to irrigate sixty acres of land lying at the edge of the city. The water delivered to this farm during 1917 was 276 million gallons. This was about 23 per cent of the amount of water pumped into the city by the city water works. A large part of the percentage lost, amounting to more than three-quarters of the total volume delivered to the city, was apparently used in the irrigation of lawns and city parks, which generous use was largely due to the small percentage of water users metered, which was between 25 and 30 per cent.

After passing through the city sewer system, the sewage enters the distributing canal at the city farm. Here it enters a three-compartment settling tank, with grates at inlet and outlet, which catch paper and large foreign matter. The sewage then enters an open dirt ditch from which it is distributed over the city farm.

A problem was presented by the fact that half of the area to be irrigated was on the opposite bank of the dry Santa Cruz river. The problem of carrying the water was solved by constructing an inverted syphon six hundred feet long, of vitrified sewer pipe. Recently this has been replaced by eighteen-inch corrugated iron pipe with joints of canvas, covered with asphalt, under the standard joint strips.

During 1917, with sixteen miles of lateral sewers, the irrigation distribution system received 276 million gallons of water; during 1918, with 32 miles of lateral sewers, sixteen miles of which was constructed in 1917, it was figured there would be a seventy-five per cent increase, for the business section of the city had already been sewered. This gave a total delivery for irrigation purposes of 483 million gallons of water delivered at the outfall. This would be sufficient to irrigate 483 acres of land on the basis of one million gallons of water per year to each acre of land. On this basis there would be enough water to irrigate 375 acres of land more than the city has at present and it is this surplus that the city contemplates selling.

The demonstration of the success of irrigating with sewage emboldened the city in recent years to invest in 120 acres of dry lands, three and a half miles north of the city, in advance of the increased supply of sewage to come from the recently constructed sewer on the north side. This land has been gradually cleared during 1917, and at the beginning of the present year seventy-six acres were under cultivation on this new farm. The application of the sewage to this new farm has been along the lines of the previous practice.

The new farm is connected to the old sewage system by means of a thirty-inch reinforced concrete pipe line. Along this line are nine manholes of standard four-foot diameter type and five weir manholes with mechanically operated gates. The pipe line is laid at a depth of eight feet below the surface and the water brought to the surface by means of the weir manholes.

The dry bed of the Santa Cruz river runs through the middle of this new farm, as well as the old farm, and to carry the water across it, twelve hundred feet of thirty-inch line was built as an inverted syphon, giving a ten-pound pressure on this part of the line.

Problems of cleansing the sewage, presented by the irrigation of the original city farm, were solved in the connection of the new farm. It has been found that, even with the use of settling tanks and grates, the land gets more or less paper from the sewage and the odor is unpleasant in the summer months. In the new farm irrigation, however, it has been noted that after traveling three and a half miles through the pipe line, the paper is dissolved and the sewage is practically clear, giving little or no odor after irrigation has been effected.

*City Engineer of Tucson, Arizona.

The WEEK'S NEWS

Federal Regulation of Road Building and Financing—Highway Developments in Pennsylvania and New Jersey—Wisconsin's State Regulation of Water and Sewerage Systems—New York's Drastic Venereal Disease Law—No Meters for Phoenix Suburbanites—Electric Rate Increases in Indiana Cities and Boston—Shortage of Firemen in Canton, O.—New York's Police Reorganization—The War Finance Corporation—Michigan City, Ind., Has "Alien Enemy" Mayor—Garbage Disposal in Schenectady and Springfield, Ill.

ROADS AND PAVEMENTS

Federal Regulation of Roadbuilding in Southwest.

Fort Worth, Tex.—J. D. Fauntleroy, district engineer of the United States Department of Agriculture, Office of Public Roads and Rural Engineering, has sent out the following letter to the various state highway departments in his district: "In regard to the submission of future Federal aid projects, I am of the opinion that many bond issues which have been voted will not meet the approval of the Secretary of the Treasury, and that therefore project statements which have been submitted wherein it is intended to finance the construction by means of money raised from bond issues will be held up indefinitely and will cause blank numbers to appear in the list of projects for your state. I therefore most strongly urge that you do not submit any more project statements to this office where bond issues are involved unless the bonds have already been voted and sold. I also suggest that in recommending project for Federal aid that you show preference to those projects whereupon the materials to be used will not have to be hauled by railroads; that is, such materials as stone, gravel, shell, etc. It is not believed that there will be any difficulty in securing the transportation by rail of cement, oils, asphalt, steel, iron, pipes, etc."

State Abolishes Road Tolls.

Harrisburg, Pa.—The state highway department has announced that the Lancaster, Elizabethtown and Middletown turnpike and the Lancaster and Williamstown turnpike, in Lancaster county, have been purchased by the state. The purchase price of the former was \$68,000, and of the latter \$90,000, and in both instances local authorities cooperated with the state. The Lancaster and Williamstown turnpike is twelve miles long and is a section of the Lincoln highway. For many years the citizens of Lancaster county have urged the abolition of tolls from these important thoroughfares. When the Lincoln highway was established in 1913, tolls were encountered only upon the Pennsylvania section of the route, and an energetic campaign has been waged ever since to eliminate them. Some short mileages of toll road still remain, but plans are well under way for their being taken over. During the past six months approximately 138 miles of toll roads have been taken over by the state.

Paving Dispute Ends in Compromise.

Dubuque, Ia.—Forestalling expensive litigation and ending a controversy that has lasted more than a year, involving the county board of supervisors, contractor Donald Jeffrey, his bonding company, the National Surety company of Chicago, and his trustee in bankruptcy, H. B. McCabe of this city, an amicable settlement has finally been reached. Under the terms of the agreement, the bonding company paid to the county of Dubuque the sum of \$6,500. The machinery used by contractor Jeffrey, under the settlement, will be left on the road until the work is completed at which time it will be returned to the bonding company which will dispose of it. It is more than three years now since the Hawkeye road improvement was inaugurated and the contract let to Donald Jeffrey. The original plan called for the expenditure of about \$75,000, but shortly after the work was started it was seen that the cost would amount to \$50,000 more than that sum. The

county was to assume the greater share of the cost, although \$30,000 of the sum was to be received from a federal road fund. The Hawkeye Improvement Association, formed here, was also to assume part of the burden. Over a year ago it was seen that the contractor would suffer loss if he completed the work under the original contract. Uncertain weather conditions, labor troubles and other incidents tended to delay the work and increased the cost of pushing the work to completion. Finally contractor Jeffrey surrendered his contract and filed a petition in bankruptcy. A trustee was then appointed. The latter attempted to push the work ahead for a time, but it was realized soon that the bonding company would have to assume entire liability. The conference at which the agreement was reached was the result of earnest efforts on the part of county and state officials to settle the matter without litigation.

Government Refuses Bond Issue Approval.

Chicago, Ill.—The Capital Issues Advisory Committee of the Federal Reserve Board has notified county superintendent of public service, Henry Zender, that it will not allow the sale of the million-dollar bond issue voted last fall. The Department of Agriculture advised the local committee that there is not sufficient agricultural necessity for the roads, and the War Department asserted that there is not sufficient military value to justify building them. This bond issue was to have been used in the construction of 48 miles of road along five routes northwest, southwest and south of the city. Road construction in the county will therefore be confined to work on contracts already let.

New Jersey's Highway War Plans.

Trenton, N. J.—The policy of the administration in adjusting the state road program to meet extraordinary conditions brought about by the war has been outlined by Governor Edge in a comprehensive report showing what has been done and will be done in the near future toward the development of a highway system. The report was prepared by state highway engineer W. G. Thompson at the request of the Governor. It shows that the plan for the current year takes into consideration the enormous increase in cost of supplies and equipment and also the request of the federal government that unnecessary construction work throughout the country be deferred for the present. That convict labor will be liberally employed in road work in order not to impair the efficiency of essential war industries is indicated in the report, which shows also that approximately \$445,000 will be allotted to the various counties as state aid and that motor vehicle funds amounting to \$1,600,000 will be distributed during the year for repair and maintenance of roads. Said Governor Edge: "The tremendous increase in the price of everything is a condition which the state, as well as individuals, must meet. It will be foolish to go ahead and undertake at once the building of all roads contemplated for normal times in these days when everything has advanced and much of our capital which can be used to advantage later on would be wasted." In the report of engineer Thompson accompanying the governor's statement the various improvements to be undertaken this year are outlined in detail. "Subsequent to submitting of the report on preliminary survey of the entire system, the commission, after careful analysis of the situation relative to the needs of commercial traffic

and the national military establishment, selected for this year's work unpaved sections of nine of the state highway routes. The engineering department immediately started detailed surveys and preparations of plans and specifications. Reasonable bids are hoped for; it will, however, be the policy of the commission to reject all bids should they be deemed excessive, and such work as cannot be performed at reasonable cost, considering abnormal economic conditions, will be deferred until conditions are more favorable. Work is to be immediately resumed and pushed to completion on the Georgetown-Wrightstown road, which was started last fall with convict labor. The work now under way with convict labor in Sussex County is to be completed early this season, after which all convicts are to be employed on the state highway system. The first allotment of federal aid for New Jersey, approximately \$59,000, will be used by Salem County in conjunction with state aid and county funds raised by bond issue, for the paving of Malaga-Penns Grove road, which will connect State Highway Route No. 6 at Woodstown with Wilmington Ferry at Penns Grove. The 1917-1918 allotment of federal aid, approximately \$118,000, will be expended with state funds on the construction of portions of Routes No. 4 and No. 13." Mr. Thompson tells of the deterioration of the roads leading to Camp Dix and Camp Merritt last fall and how the state took up the repair of these highways, which was temporarily abandoned during the winter, but was resumed on April 15, and which is now being completed. So satisfactory was the work done by reformatory inmates on the Camp Dix road that this labor is to be used on the road between Menlo Park and Rahway, while the convict force now located in Sussex County will be utilized on the mountain section of Route No. 9 at West Portal. In connection with his announcement of funds to be distributed to the counties as state aid, Mr. Thompson says: "Many of the counties have instituted a regular patrol system, by which men are assigned to certain sections of roads and supplied with materials of which their particular section is constructed; thus, by constantly watching for breaks or faults in the pavement and condition of drainage, repairs are made at once, before serious breaks occur. The system, when adopted by all counties, will greatly reduce cost of maintenance and insure better traveling conditions generally. In all of the work referred to in the foregoing report which contemplates the use of free labor, opportunities will be afforded contractors to submit bids and if the estimates are not too high, the contracts will be awarded."

SEWERAGE AND SANITATION

Dealers Claim Milk Regulations Unconstitutional.

Portland, Me.—Claiming that the proposed new by-law of the board of health which makes it incumbent upon non-producing milk dealers to have their milk pasteurized and to lessen their bacterial count to 50,000 per cubic centimeter, is contrary to the 14th amendment to the Constitution of the United States, eight such dealers have brought a bill in equity in the United States district court at Portland seeking to have the board of health restrained from putting this by-law into operation. The procedure is an interesting new step in the milk controversy which has been waged here since the board of health announced this by-law. Originally the matter was brought to a focus by protests against the tuberculin test, which had been made imperative in the case of both non-producing and producing dealers. Pasteurization was proposed as an alternative to the tuberculin test in the case of dealers who did not control the sources of their own supply, but was combatted by such dealers on the ground that the expense of installing pasteurization plants would be so great as to take away the profits of their business. Proponents and opponents of the tuberculin test and of pasteurization presented their viewpoints at a number of hearings. Meanwhile in accordance with statute the proposed by-law was submitted to Justice George E. Bird of the supreme court, and was approved by him. Allegations in the

bill are that the new by-laws is a violation of the Constitution of the United States; that it violates the police powers of the state in that its regulations are unreasonable and unjust; that its enforcement will cause serious injury to the plaintiffs; and that it will produce a multiplicity of suits. Accordingly they ask the court to prevent the enforcement of the by-law until there has been a hearing on the merits of the case. The clauses in the by-law to which the dealers take exception are those defining Grade B milk. According to the provisions of the by-law milk which has been tuberculin tested, has not over 100,000 bacterial count and is bottled and distributed by the producer, is classed as Grade A milk and the cream derived from such milk which has not over 500,000 bacterial count as Grade A cream. Grade B milk shall mean milk, all of which is produced by healthy cows, as determined by physical examination within not exceeding one year previous by a qualified veterinarian, which shall not at any time prior to pasteurization contain more than 500,000 bacteria per cubic centimetre, and after pasteurization and prior to delivery to consumer not more than 50,000 bacteria per cubic centimetre. Grade B cream as defined by the by-law means cream derived from Grade B milk, which shall not at any time prior to pasteurization contain more than 1,000,000 bacteria per cubic centimetre and after pasteurization and prior to delivery to consumer not more than 200,000 bacteria per cubic centimeter.

State Sanitary Regulation in Wisconsin.

Madison, Wis.—Investigations with a view to developing purer water supplies and improved sewage disposal and drainage facilities in many Wisconsin centers were made during the first quarter of 1918, according to a report just filed by E. J. Tully, state sanitary engineer. Well waters were found contaminated at Baldwin and treatment was recommended. A public sewer system was advised as the only permanent solution. At Oshkosh extensive surveys were made at the city's new filtration plant, and additional chemical treatment advised and other changes suggested. A system of charts for recording the daily data was outlined. Pollution of the well water used in the town of Lake, Milwaukee county, was disclosed and steps advised for preventing its continuance. At Stevens Point an investigation was made to ascertain the influence of industrial waste discharged from the Mosinee Paper company's plant on the quality of the public water supply. Recommendations were made for purification of the river water used as a public supply by a system of sand filtration and use of aluminum sulphate and installation of filtration units at the Mosinee paper plant. Well water pollution was discovered at Phillips and preventive measures recommended. Sewage treatment and disposal investigations were pursued at Oconomowoc, West Allis and Wauwatosa, and industrial waste problems combatted at North Milwaukee, Milwaukee, Mattoon and Mosinee. Stream pollution investigations were conducted at Mud Creek, North Milwaukee; Kinnickinnic river, West Allis; Milwaukee river; Mosinee and Stevens Point; Elk river and Drury's lake, Phillips; Red Cedar river, Colfax; and Mattoon. Plans for a public sewer system were approved for West Allis, Lake Mills and Cadott and plans for sewer systems were taken under advisement for Campbellsport, River Falls, Portage and the township of Neenah.

Drastic Health Law to Protect Soldiers.

New York, N. Y.—A health law, described as being the most drastic ever enacted in any state in this country, which was passed by the legislature at Albany at the request of the federal government for the protection of soldiers and sailors, has gone into effect. It provides for the arrest and detention during treatment of persons afflicted with venereal diseases. Officials of the health department were sent to the Night Court for the purpose of enforcing the law, the administration of which is placed by the law mainly in the hands of the health department. Health commissioner Copeland said that this was a wonderful law and that the part which the federal government

had played in its enactment foreshadowed a time when the federal health department would control and direct the work of local health departments in all cities. The law resembles the Page act, which was in effect some years ago until it was declared unconstitutional by the state court of appeals. The law was held to be class legislation because it applied to women only, but the new Whitney act applies equally to men and women. The health department intimated that arrests would be made under this act at the beginning at the rate of twelve a night. The prisoners will be held for a diagnosis. After that only those will be held who are suffering from a communicable form of the diseases specified in the act. They will be held in city hospitals, or may be released at the discretion of the health authorities upon guarantees that they will receive treatment. Those who are detained will be kept in hospitals for the necessary period until they cease to be likely sources of contagion. The federal health authorities have turned over to the department of health a list of "suspects," who have been named by soldiers who have been questioned at army hospitals. The complaint may be made by any person, soldier or civilian. It was announced at the health department that men were to be arrested as well as women.

WATER SUPPLY

Must Stop Free Use of Water.

Canton, O.—Findings totaling \$2,790 are made by state examiner Moul in a report on the Canton waterworks department for the year ending March 31, 1918. The findings are practically all of a technical character and are along lines which have been touched on before in previous reports of the state on this department. The examiner lists the value of free water furnished illegally by the department at \$2,304 and points out that the law specifies what institutions and departments shall be furnished free water. Much of the free water went for the flushing of streets and he advises that this free use of water contrary to the law be stopped. Findings totaling \$1,074 for water furnished the schools, hospitals and the public library at a price of 30 cents per 1,000 cubic feet, where 52½ cents per thousand cubic feet should have been charged, are made by the state examiner. Of this sum, \$773 is apportioned between former service director Starrett and the various institutions, and \$301 is divided between service director DeCorps and the schools and hospitals. The report states that at the time it was completed there were about 15,000 water consumers. Of this number 1,600 were on meters and the balance were paying for their water by a flat rate. The clerks and various officials having to do with the management of the department are commended by the examiner.

Consumers Out of City Need No Meters.

Phoenix, Ariz.—Consumers of city water who reside outside the city limits of Phoenix do not need to install meters and pay for the water at a measured rate, but may continue to pay the flat rate in force for several years. This decision, which is of much interest to the several hundred people who live outside the city limits of Phoenix and who are consumers of city water, was made by the state corporation commission and settles a matter that has been in controversy for more than a year. The particular complaint against the city was filed with the corporation commission on January 12, 1917, by D. B. Harrer. Mr. Harrer, who lived outside the city limits, had for a long time been a consumer of city water at a flat rate. The pipe line from the city limits to his residence had been installed at his own expense. The city, early in 1917, notified these outside consumers that they must install meters at their own expense. Harrer objected, and on January 12, 1917, the pipe line running to his residence was disconnected by the city. He immediately made formal complaint to the corporation commission. The city, answering the complaint, insisted that under the constitution of the state, municipal corporations were exempt from the jurisdiction of the corporation commission. The case was heard in March, the commission holding that the city in serving water beyond the city limits subjected itself to the provisions of the con-

stitution and statutes of the state applicable to public service corporations and ordered it to continue service to the complainant. It was urged by the city that under its "Home Rule" charter it was authorized to extend its municipal activities outside the city with respect to furnishing water. The commission ruled that if the city elected to carry on the business of serving water outside the city it must do so as a private corporation. It was stated at the hearing that at that time there were about 5,100 consumers of water within the city and 290 outside. It was the desire of the city, it was stated, to change from a flat rate to meters, because residents outside the city were in many cases using the water for irrigation purposes, contrary to the law, they being out of reach of criminal prosecution by the city. It was ordered that, effective on or before April 25, 1918, the city shall reinstate the rates, rules and regulations in effect for the service of water to customers outside the city limits of Phoenix prior to the change whereby customers were required to install meters at their own expense necessary to serve them. It was also ruled that the city violated the law in changing rules and regulations in effect without authority of the corporation commission.

Company Must Pay for Excess Diversion.

Trenton, N. J.—Liability of the East Jersey Water company to pay for water in excess of that diverted by the company from the Passaic river at Little Falls at the time of the passage of the excess diversion act in 1907 has been established by the supreme court in an opinion filed by justice Bergen. The decision affirms the action of the state Department of Conservation and Development in assessing both the East Jersey and Acquackanonk water companies for excess diversion during the last half of 1915 and the year 1916. The important point decided is that the exemption granted by the act of 1907 included only so much water as the East Jersey and other companies were legally diverting at that time. The East Jersey claimed a right to exemption for further diversions on the ground that it was under contract to supply various municipalities and was legally authorized to do so. Such a construction of the law, justice Bergen pointed out, would render the statute practically inoperative. Justice Bergen stated the rule governing excess diversion in the syllabus of his opinion as follows: "The words of the statute, 'now being legally diverted,' mean the amount being diverted according to law in 1907, when the act went into effect, and do not extend to a quantity which, by contract, the corporation may subsequently require to supply increased needs of those with whom it has contracted to supply water. An abstractor may take what it was in 1907 diverting, and, if that did not reach the statutory maximum exemption, as much more as is required to make the total maximum diversion allowed without payment of the license fee. If in 1907 the daily diversion exceeded 100 gallons per capita, the amount then diverted may be taken without payment, and if it was less, no license fee can be imposed until it exceeds the statutory quantity."

STREET LIGHTING AND POWER

Commission Allows Rate Increases.

Indianapolis, Ind.—Inasmuch as coal and power-house labor constituted a larger proportion of the cost of electric current sold at low rates for power than of cost of current sold at higher rates for domestic and commercial use, it is just to provide for necessary increases in revenue by a surcharge on power rates alone, it was decided by the Indiana public service commission. The stand was taken in two decisions, one granting a surcharge of 5 mills for electric power rates in Elwood, Alexandria, Orestes and rural districts adjacent, and the other granting a surcharge of 4 mills for power rates in Marion, Jonesboro, Gaston, Matthews, Upland, Sweetser, Summitville, Fowler-ton, Gas City and rural districts adjacent. A large industrial district in Indiana is affected by the surcharges. G. I. Sellers & Sons Company protested against the proposed surcharge in the Elwood case, and argued that any increase

should be borne proportionately by domestic and other consumers as well as by industrial plants. This company, which would have to pay 1.25 cents a kilowatt hour, or a 46 per cent. increase under the new rate, threatened to put in a plant and produce its own power if the surcharge were granted. The Indiana General Service Company serves Elwood, Alexandria, Orestes and adjacent rural districts in which a surcharge of 5 mills a kilowatt hour is granted, and the Marion Light and Heat Company serves Marion and other places in which a surcharge of 4 mills a kilowatt hour is granted. The Marion company asked for a surcharge of 5 mills. The essential points of the decision in the Elwood case, which is for the most part the same as in the Marion case, are presented in a syllabus. Some of the points, in addition to the one already given, are as follows:

"The possibility of an increased volume of business during the present fiscal year does not insure a corresponding increase in net income, since labor and materials will be correspondingly higher. Increased cost of producing power due to war prices of materials and labor should not be met by drawing on surplus accumulated largely from profits on domestic and commercial rates. In considering a proposed surcharge, the existence of low power rates elsewhere enjoyed by competitors of the power users affected is immaterial. Where power users enjoy unusually low rates the revenue made necessary by increased war costs should be provided by a surcharge on power rates. A utility should not be compelled to sell current at an actual loss to business concerns, engaged like itself, in business for profit. Where a utility has become largely an industrial power plant, power users should bear a larger proportion of its cost of operation. Since increased cost has largely been anticipated by purchasers of power and collected from customers in the form of higher prices a surcharge on power rates is just. Since demands for increased supply of current and additional power facilities come largely from power users, the cost of maintaining the credit of the utility at a point where it can obtain the necessary capital should be borne by power users."

The surcharge in the Elwood case begins with April 1 of this year and runs until further order of the commission, but in no event more than ten years. The same time provisions apply to the Marion case.

Gas Rate Increase Authorized.

Boston, Mass.—The commonwealth gas and electric light commission has authorized the East Boston Gas Company, supplying that section of Boston and the city of Chelsea, to increase its price from 80 to 95 cents per thousand feet for the duration of the war. "During a period of such exceptional and unprecedented costs," says the board in its order, "it has seemed expedient and just to grant such temporary relief as the circumstances warrant." Should it be shown after the war that 95 cents is an excessive rate, it will be reduced by the commission.

Long Cable Span in Norwegian Power Plant.

Stavanger, Norway.—According to consular reports the power transmission line from Florli to Stavanger was recently completed and is ready for service, awaiting only the completion of the power plant at Florli. This will make 12,000 horsepower available for the Stavanger Electric Co., to be used for lighting and power. The line is built with copper cable stretched on wooden trestles, with spans of 250 meters (273.4 yards), and has a capacity of 50,000 volts. Hogsford is crossed by a single span, with a length of 1,384.2 meters (1,513.76 yards), said to be the longest in the world. The span is composed of three cables of crucible steel, since copper or aluminum would not be able to stand the strain. Copper-sheathed cable would have been preferable to prevent loss of voltage, but under present conditions it could not be obtained. Each cable has a diameter of 16 millimeters (0.63 inch), is composed of 19 strands, and has tensile strength of 150 kilos per square millimeter (330 pounds per 0.00155 square inch), and a total of about 22 metric tons for the whole cable. A sufficient margin of safety is thereby secured, as in calm weather a strain of 4 tons is exerted on the cable between the two terminals, which increases to 7 tons in a high wind. The slack of the cable is 80 meters (87.5 yards), and in a strong wind will oscillate 50 meters (54.7 yards). To prevent contact of cables the masts are built 15 meters (16.4 yards) apart. The land framing the fjord at this point being elevated the masts are only 7 meters (23 feet) high, but the distance from the water's edge to the lowest point in the slack of the cable is 40 meters (43.7 yards), therefore

no interference is offered to shipping. Insulation of the cables at their terminals is secured by four ordinary upright insulators for each cable.

FIRE AND POLICE

Close Fire Station Because of Man Shortage.

Canton, O.—One district fire station has been closed by fire chief Mesnar and another station probably will be closed shortly because of the shortage of men in the fire department. The department had 46 men working while 60 men are provided by city ordinance and during the vacation period opening May 1 the department will be short about four more men during the summer, or will be operating on a force of 42 men and officers. The closing of the station followed a conference between chief Mesnar and safety director Hamaker. There should be four men at the station closed, but there were only three and one of these left the house, leaving two firemen. One of the two remaining went home on account of sickness, the chief says. The machine was brought to headquarters for the present. This station will probably be reopened and will be one which has a pump shut so the pump could be used from the central station. All efforts of officials and the civil service commission to get firemen to take jobs at the present rate of pay have proved unavailing. There are plenty of applicants for police jobs, but only three men took the firemen's examination recently, and these men were working under provisional appointments. Three cadets in the fire department have quit during the past three weeks.

Fire Sweeps Island.

Bay Shore, N. Y.—An uncontrollable fire swept along Fire Island Beach, destroying six houses and razing board walks and some summer shelter houses in Fire Island State Park. A five-mile stretch of beach hills was blackened clear out to Point of Beach, where the Fire Island Inlet stood as a barrier against further damage. The crew of the Fire Island coast guard station, a detachment of fourteen men from the Bay Shore naval air station, and boatmen and beachmen for miles around fought the fire for about seven hours. A cottager at Saltaire started a fire in the morning to burn rubbish and the tall, dry beach grass took fire. The strong prevailing east wind soon got the flames beyond control, and they licked westward at an alarming rate. After a group of buildings had been left a heap of ruins an attempt was made to backfire, but this also got beyond control. Sweeping past the telegraph and wireless stations and the Fire Island lighthouse, the blaze attacked the State Park with consuming fury, leveling a long stretch of boardwalk and destroying summer houses. The Inlet prevented what might have been a conflagration. This stretch of water was all that stood between the raging flames and the thickly-settled summer colony on Oak Beach.

Police Reserve and Training Forces Organized.

New York, N. Y.—Special deputy police commissioner Rodman Wanamaker has announced his detailed plans for the organization of the Police Reserve Force, which the Hylan city administration is forming to merge with and take the place of the Home Defense Corps organized by mayor Mitchel. There will be two distinct divisions of the force, according to deputy commissioner Wanamaker's plans. One will be the Police Training Corps, which young men will enter with the intention of graduating eventually as full-fledged policemen, while the other will be a civilian reserve divided into neighborhood and business units, the men in which will be called upon only for emergency duty and to qualify as reserve patrolmen or for special services in the mounted, harbor or air reserve. All the men swearing in will be required to sign a pledge to obey all orders. The members of the force will have uniforms, provided by the city, and will wear badges. There will be officers, non-commissioned officers and privates, and promotions will be made according to ratings in examination and work. "The Order of Liberty" will be established as an honorary de-

gree, and medals will be given to those qualifying. There will be three grades to the order, signified by bronze, silver and gold medals. The training corps, from which men will be trained to enter the regular uniformed force, will be recruited particularly from young men between the ages of 18 and 28, who, according to Mr. Wanamaker's regulations, "are not liable to be called to service by the Federal Government in the immediate future." All applicants for this corps must be examined by a police surgeon for the purpose of determining whether their physical condition comes up, or can be built up, to the standard requirements of the municipal civil service commission, and no applicant will be admitted who is not qualified physically. The members of this corps must attend training classes in the evening as directed and those who do not make reasonable progress are to be dropped. The training provided is to be the same as that provided for candidates for the regular force. The members of the regular force are to be recruiting officers for this corps. All police stations will accept applications to be forwarded to the department commanders. Mr. Wanamaker explains that this system will save the city much money in the training of the future policeman because these men will be graduated as ready for active duty, whereas at present the city has to pay the salaries of men during a three months' training course after they have been accepted by the city and placed on the city payrolls.

GOVERNMENT AND FINANCE

Federal Board Controls Financial Operations.

Washington, D. C.—The first step in the organization of the \$500,000,000 Government War Finance Corporation, the biggest institution of the kind ever created, was taken when President Wilson nominated four directors who, with Secretary McAdoo, will conduct the work of aiding in financing essential war enterprises. At the same time, the President nominated seven members of the new Capital Issues Committee, which will replace the Federal Reserve Board's Capital Issues Committee, in exercising a voluntary regulation of securities issues of more than \$100,000. The Finance Corporation Directors nominated by the President are W. R. G. Harding, Governor of the Federal Reserve Board; Allen B. Forbes, New York, private banker and securities dealer, member of the present Capital Issues Committee's advisory sub-committee; Eugene Meyer, Jr., New York banker and business man, member of the National War Savings Committee, and connected with the War Industries Board, and Angus W. McLean, banker and lawyer, of Wilmington, N. C. Mr. Forbes declined the nomination. Members of the new Capital Issues Committee were named as follows: Charles S. Hamlin, member of the Federal Reserve Board, former assistant secretary of the treasury; John Skelton Williams, controller of the currency, and director of finance and purchases of the railroad administration; Frederic A. Delano, member of the Federal Reserve Board; Henry C. Flower, Kansas City banker; Frederic H. Goff, Cleveland banker; James B. Brown, banker, of Louisville, Ky., and John S. Drum, San Francisco banker and lawyer. Mr. Hamlin and Mr. Delano are members of the present Capital Issues Committee, and Mr. Flower and Mr. Goff are members of the advisory sub-committee. Paul M. Warburg, now a member of the Capital Issues Committee, was not appointed on the new body, so that his time may be free to manage affairs of the Federal Reserve Board, much of whose work will fall on him as vice-governor, because of governor Harding's appointment on the War Finance Corporation. The organization of the big corporation with a half billion dollars' capital, furnished by the government, and with authority to issue \$3,000,000,000 bonds, is considered the most important development in the financial history of the country since the formation of the Federal Reserve Board a few years ago. It will establish virtually a pool of the nation's investment resources, to be drawn upon to maintain war industries and businesses. The corporation will use the Federal Reserve system extensively for administering its huge financial transactions, and through Mr. Harding there is effected an interlocking di-

rectorate between the Federal Reserve Board and the corporation. On the Capital Issues Committee, Mr. Williams will represent the interests of railroads whose securities ordinarily form a large proportion of the securities floated annually. In addition, he will represent the national banking system in his capacity as Controller. The existing Capital Issues Committee, since its organization three and one-half months ago, has developed an extensive system of examining the merits of proposed security issues, through the co-operation of sub-committees in each Federal Reserve district, composed of bankers and business men acting as volunteers, and this machinery probably will be used by the new organization. The committee in the last three and one-half months has approved new issues aggregating \$103,000,000, and refunding obligations which did not involve issuance of new capital amounting to \$238,000,000, and has disapproved \$44,000,000. In addition, arrangements were made informally for the postponement of more than \$8,000,000 securities, and many millions were frowned upon by the district subcommittees and thus prevented from going on the market.

The Capital Issues Committee recently adopted the following resolution: "Effective immediately, this committee reduce from \$500,000 and over to \$100,000 and over the minimum of security issues of industrial and public utility corporations that it will consider." This action is taken by the committee in furtherance of its policy heretofore expressed of adapting its methods to those prescribed for the guidance of the Capital Issues Committee created by the War Finance Corporation Act which, in section 203, provides that the committee may consider applications of \$100,000 and over. The committee has heretofore observed the \$100,000 minimum only with respect to municipal issues. Its action will tend to relieve the embarrassment of those desiring to issue at this time securities, the aggregate of which is above the minimum prescribed by the statute and yet below the minimum heretofore considered by the existing committee.

Adopt Commission Form.

Weatherford, Tex.—Commission form of city government has been adopted here at a special election. The vote was 261 for the new charter and 234 against it.

Councilman Convicted of Accepting Bribe.

Youngstown, O.—A verdict of guilty was returned by the jury in the trial of William F. Mehlo, city councilman on an indictment charging acceptance of a bribe in connection with a franchise grant to the Workmen's Transit company a recently organized jitney bus corporation on a second count charging solicitation of a bribe. Six other city councilmen await trial on similar charges. The verdict was returned after five hours deliberation. Attorneys for Mehlo stated that a motion for a new trial will be made.

"Alien Enemy" Mayor Arrested in Washington.

Michigan City, Ind.—Frederick C. Miller, mayor of Michigan City, was arrested as an alien enemy when he came to Washington, D. C., to discuss prospects of completing his naturalization as an American citizen. He was later released and allowed to depart for home. Miller said he came to this country with his parents when 5 years old and that his father became a citizen long before the mayor reached the age of 21 years. Political enemies, he asserted, started the report that the Charles Miller who obtained citizenship papers was not his father, and he took out first papers with a view to removing any doubt as to his citizenship. He is serving his third term as mayor. He became mayor of Michigan City last January after a futile attempt in the federal courts to prevent him from taking office on the ground that he was not a citizen. Secret service men had been advised that Miller was en route to Washington. They followed him from the railroad station to a hotel and arrested him as he was registering. Miller is also subject to internment for having violated the presidential order that enemies may not leave their homes without permit. "What am I if I am not an American? I certainly am not a German," said Miller. "My life and my

actions must speak for themselves. My loyalty cannot be questioned. Even if I had a roomful of naturalization papers my patriotism could not be more sincere than it is now."

STREET CLEANING AND REFUSE DISPOSAL

To Investigate Operation of Garbage Plant.

Schenectady, N. Y.—An expert investigation of the garbage disposal plant is to be made at a cost of \$500 to determine why the plant is falling back in its rate of production, and when the trouble is located a contract will be entered into with the C. O. Bartlett and Snow Company of New York City to make what changes are necessary. This was determined at a meeting of the board of estimate and apportionment at the request of commissioner of public works S. M. Bishop. The commissioner has an available \$500 in his budget which will defray the cost of the expert. The examination and recommendations will be made by H. H. Bighouse, a garbage plant expert connected with the Bartlett and Snow Company. Commissioner Bishop told the board the garbage plant now is consuming three times as much gasoline as other plants of its size and type are using; that it is producing but forty-eight pounds of grease from each ton of garbage as against an average production of from sixty to sixty-five pounds, and that it is constantly losing tankage by having to take out the crusher. The loss to the city from the falling off in grease returns alone, the commissioner said, amounts to \$5,000 a year.

Private Garbage Collections Save City Money.

Buffalo, N. Y.—Councilman Arthur W. Kreinheder has sent a letter to the mayor, explaining that the private collection of garbage is not mulcting the city out of revenue, but is saving it about \$15,000 a year, and for that reason it has not been discouraged. He says: "At the present time we have a contract for the disposal of our garbage with the International Agricultural Corporation at the rate of \$1 per ton. We are well aware that private collectors are collecting garbage not only in the tenth precinct, but in every precinct, and have never attempted to stop them for the reason the less garbage we deliver to the garbage destruction plant the less we have to pay; secondly, there is less garbage for us to transport, and, thirdly, because we understand that this garbage which is collected by private concerns is fed to hogs. It is our understanding that the United States government is desirous of utilizing every pound of garbage which is collected, and also that the government is heartily in favor of feeding hogs with garbage as this helps to conserve our food supply. We estimate there are approximately 5,000 tons of garbage per year collected by private concerns. You can readily see if we collected this ourselves it would mean an additional expense of close to \$15,000, as transportation and disposal would have to be figured."

Permanent Injunction Against Rendering Plant.

Springfield, Ill.—The question of the disposal of dead animals is put up to the city of Springfield by the granting of a permanent injunction against the operation of the rendering works northwest of the city. The injunction was granted by judge Frank W. Burton as the end of the litigation arising from the case of four taxpayers against the city of Springfield and the operators of the plant. A bill for injunction was filed in the circuit court on February 24, in which it was set up that operating under a lease from the city which owns the ground on which the fertilizer plant is situated the operators were maintaining a nuisance and a menace to the health of the people residing in the vicinity of the plant. Incidentally a complaint was made against the Town Branch sewer smells. The master in chancery to whom the case was referred approved the Town Branch sewer, but declared that the fertilizer plant must go. After exceptions to the master's report had been withdrawn and attorneys for the operators had signified their withdrawal from the case as counsel, judge Burton signed the decree of injunction. The city of

LEGAL NOTES

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Recall Election—Charter Provisions—Signatures.

(Cal.) Any person elected or appointed to office under city charter is presumed to accept same with condition that his tenure may be terminated at any time in manner prescribed in such charter.—*Baines v. Zemansky*, 168 P. 565.

(Cal.) Const., art. 11, §8½, par. 4, conferring "plenary authority" to provide for "recall and removal" of officers, makes it competent for charter to provide that an officer have sole jurisdiction to decide sufficiency of petitions for recall.—*Baines v. Zemansky*, 168 P. 565.

San Francisco Charter, art. 11, c. 3, construed as a whole, gives registrar of voters exclusive final jurisdiction as to sufficiency of petition for recall as to legal requirements and whether signatures are genuine, and he must make a determination in fifteen days.—Id.

Although under San Francisco Charter, art. 11, c. 3, relating to recall, inquiry as to genuineness of signatures to petitions for recall is limited by section 3 to call in voter, officer being recalled can question genuineness of signature and have voter notified.—Id.

Water Pipes—City Ownership—Sale.

(Ga.) Where water pipes were acquired and held for special non-governmental purpose the city, when it had no further use for them, could lawfully convert them to another use or dispose of them.—*City of Gainesville v. Dunlap*, 94 S. E. 247.

Provision of amendment to charter of city of Gainesville (Acts 1892, p. 168, §2) held not to prohibit city's sale, under duly adopted ordinance, of certain water pipes laid by it as part of its water system and subsequently abandoned.—Id.

Legislative Control—Street Railway—Franchise—Fares.

(Mass.) Legislature may modify or annul city's grant of location of street railway to maintain tracks on bridge without violation of any constitutional provision.—*City of Fall River v. Public Service Commission*, 117 N. E. 915.

Under St. 1898, c. 578, §11, where location of tracks on bridge granted street railway was not original location neither company nor successor was required to reimburse city for expenditures in making repairs of roadway, though it was condition of grant of location that railway should repair.—Id.

Under St. 1913, c. 784, Public Service Commission properly permitted Bay State Street Railway Company to discontinue sale of tickets over Slade's Ferry Bridge at Fall River at rate of six for twenty-five cents, though rate over bridge had been made condition by city of grant of location.—Id.

Payment of Street Sweeper—Mayor's Signature.

(Mo. App.) Under Rev. St. 1909, §9226, whereby a city of the third class can only pass an order of council with the mayor's concurrence an ordinance not signed by the mayor was void.—*Baker Mfg. Co. v. City of Richmond*, 198 S. W. 1128.

(Mo. App.) Where an ordinance was absolutely void because not signed by the mayor there could be no ratification or estoppel on the part of the city.—*Baker Mfg. Co. v. City of Richmond*, 198 S. W. 1128.

Where an ordinance authorizing the purchase of a street sweeper and a grader was absolutely void because not signed by the mayor the fact that the council paid for the grader did not ratify the contract.—Id.

Springfield and its officers and employees are enjoined from leasing the ground or the fertilizer plant to any one for the purposes for which it has been used in the past. The plant has been closed since the temporary injunction of February.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading ones published in other countries, dealing more or less directly with municipal matters. The Index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

Roads and Streets.

Principles of Design:

Purely Theoretic Super Elevations Modified for Roads. Slight distance ability to stop, and safety for horses, will limit banking on curves. Slower speed desirable. By W. S. Downs. 1 ill., 1,000 words. Engineering News-Record, April 25. 20 cts.

Chart for Laying Out Curves by Tangent Offset. For field work use of highway engineers. By E. R. Keller. 1 ill., 400 words. Engineering & Contracting, April 3. 15 cts.

Standard Reversed Curve for Jogs in Main Highways. Illinois adopts design for improved roads at points where section-corner corrections make dangerous offsets. By C. M. Hathaway. 1 ill., 1,000 words. Engineering News-Record, April 25. 20 cts.

Safety Provision on California Mountain Highways. The "Day Lighting" curves, by cutting berms to increase the distance drivers can see ahead, make blind turns safer. 1 ill., 500 words. Engineering News-Record, April 4. 20 cts.

Operating Cost of Highways. Consideration of effect of surface upon tractive force and of this upon cost. By A. N. Johnson, consulting engineer, Portland Cement Assn. 1,200 words. Cement and Engineering News, April. 25 cts.

Principles of Road Construction. Abstract of report of committee of Amer. Soc. of Civil Engrs. Selecting paving material. Grade, width, thickness, drainage, foundations, joints, cushion course and finishing surface. 3,200 words. Municipal Journal, April 20. 10 cts.

Efficiency in Road Drainage. The need for better construction and maintenance of culverts and small bridges. By N. B. Garver. 3 ills., 1,400 words. Good Roads, April 20. 15 cts.

Bases:

Considerations Affecting the Design of Pavement Foundations. By H. J. Fixmer. 2,000 words. Municipal Engineering, April. 30 cts.

Bituminous and Broken Stone Bases. Letter from Harry E. Devereaux, citing instances of cracks over such bases. 1 ill., 200 words. Municipal Journal, April 20. 10 cts.

Highway Construction:

The 1918 Highway Construction Projects of Several States. Reports from State Hwy. Comms. of several States. 5,000 words. Engineering and Contracting, April 3. 15 cts.

County Highway Work Performed During 1917. Data furnished expressly for these tables by county highway officials in all sections of the country. Amount, nature and cost of each kind of road construction in each county. 7 pages. Municipal Journal, April 20. 10 cts.

Road Work During 1918. Amounts that the highway authorities of the several states expect to lay during the present year. How the funds will be raised. Effect of war conditions on road program. 3,500 words. Municipal Journal, April 20. 10 cts.

Kansas Roads. Brief description of work done in that state. 1 ill., 1,000 words. Better Roads and Streets, April. 20 cts.

Maintenance:

Roads Maintenance and Automobile Fees. Fees received by Maryland Road Comm. not sufficient to maintain highways. 1 ill., 700 words. Municipal Journal, April 20. 10 cts.

Maintenance and Necessary Revenue for State and State Aid Roads. Cost of maintaining Maryland roads and revenues available. By Frank H. Zouck, Chm. Maryland State Roads Comm. 12 ills., 2,500 words. Better Roads and Streets, April. 20 cts.

Motor Equipment for Highway Maintenance Work. Light trucks and trailers combine the advantages of the patrol with the economy of the gang system. By W. R. Farrington. 3 ills., 1,200 words. Engineering News-Record, April 4. 20 cts.

Maintenance Required Under Federal Aid Act. Brief explanation of requirement. By J. C. Carpenter, U. S. Hwy. Engr. 1,800 words. Southern Good Roads, April. 15 cts.

Uniform Maintenance Cost-Records for Roads Adopted in Washington. Recent legislation having allocated sufficient funds, also regulates their expenditure and demands that county authorities keep all primary roads up to state standards. By Geo. F. Cotrell. 2,800 words. Engineering News-Record, April 4. 20 cts.

Accounting:

Uniform Methods of Road Construction Accounting Desirable. Variety of systems now in use makes comparisons of cost practically impossible. Items should be separated according to the nature of the operation. Equipment and perishable tools account. By Edw. N. Hines. 3,000 words. Engineering News-Record, April 11. 20 cts.

Maintenance Accounting in Washington. Uniform cost estimates and reports on county work under the State Hwy. Dept. 3 pages. Good Roads, April 13. 15 cts.

County Highway Records. Desirability that county officials keep detailed records and cost data. 500 words. Municipal Journal, April 20. 10 cts.

Uniform Road Accounting. Abstract of paper presented at Univ. of Michigan by Edw. N. Hines, Chm. of Wayne County Road Commrs. 600 words. Canadian Engineer, April 4. 15 cts.

Bituminous Pavements:

Method of Constructing Asphaltic Concrete on Dundas St., York Co., Ontario. Detailed description of the work. 5 ills., 2,400 words. Engineering & Contracting, April 3. 15 cts.

Long-Lived Coal Tar Pavements at Washington, D. C. List of such pavements. 1,000 words. Engineering & Contracting, April 3. 15 cts.

The Physical Condition of an Asphalt Pavement an Important Factor in Determining the Resistance to Traffic. By C. L. Cook. 700 words. Engineering & Contracting, April 3. 15 cts.

Bumps and Waves in Bituminous Sheet Pavements. By W. L. Hempelman. 1 ill., 1,400 words. Municipal Engineering, April. 30 cts.

Application of Bituminous Materials for Surface Treatments on Gravel and Broken Stone Roads. Paper before American Assn. for the Advancement of Science. By Julius Adler. 3,500 words. Better Roads & Streets, April. 20 cts.

Oil Embargo Threatens Destruction of Roads Worth Tens of Millions. A letter from Col. Sohler of the Mass. Hwy. Comm., and editorial comment. 1,300 words. Municipal Journal, April 6. 10 cts.

A Louisiana Road for War-Time Traffic. Connecting Alexandria and Camp Beauregard. Five per cent. limiting grade necessitates considerable grading. Warrentite laid on broken stone base. Mixtures used. Eliminating grade crossings. Difficult pier construction. 6 ills., 1,400 words. Municipal Journal, April 20. 10 cts.

Concrete Pavements:

Methods of Curing Concrete Pavements. Ponding and covering with earth in Logan, Utah. 2 ills., 800 words. American City, April. 40 cts.

Construction Plant and the Methods Employed in Building Concrete Roads in Wayne County, Michigan. 8 ills. 3,000 words. Municipal Engineering, April. 30 cts.

Street Paving at Boulder, Colorado. Method of constructing concrete curb and gutter and concrete pavement. By H. E. Phelps, Asst. Prof. of Civil Engineering, Univ. of Colorado. 3,000 words. Engineering and Cement World, April 15. 15 cts.

Suggested Specifications for Roller Finish. 4 ills. 400 words. Engineering and Cement World, April 1. 15 cts.

How to Inspect Concrete Paving. Practical suggestions concerning all parts of the work by F. E. Semon, City Engr. of Port Angeles, Wash. 1 ill., 2,500 words. Concrete, April. 25 cts.

Wood Block Road Joints. Use of wooden strips between slabs of concrete pavement. By P. L. Brockway, Asst. City Engr. of Wichita, Kans. 1 ill., 700 words. Concrete, April. 25 cts.

New Features in Concrete Pavements. Hand roller and canvas belt. Eliminating waves. Resurfacing with concrete, hydrated lime, expansion joints and measuring aggregates. 1,600 words. Municipal Journal, April 27. 10 cts.

Concrete Roads on Steep Grades. Methods of construction employed by New York State Hwy. Dept. 1 ill., 600 words. Municipal Journal, April 20. 10 cts.

Laying Concrete Pavement in Freezing Weather. Method employed successfully last winter at Ft. Oglethorpe. Thawing sub-grade. Warming at night with lanterns under canvas. 800 words. Municipal Journal, April 6. 10 cts.

Brick Pavements:

Using Home-made Equipment on a Small Monolithic Brick Pavement Construction Job. By Fred R. Charles. 700 words. Municipal Engineering, April. 30c.

Study of Fillers for Street Pavements. Brief discussion of both bituminous and cement fillers. By Karl C. Kastberg, City Engr., Des Moines, Iowa. Engineering and Cement World, April 15. 15 cts.

Wood Block:

Recommended Procedure in the Construction of Wood Block Pavements. By Lambert T. Ericson. 1 ill., 1,000 words. Municipal Engineering, April. 30 cts.

Dust Preventives:

Progress Reports of Experiments in Dust Prevention and Road Preservatives, 1916. From bulletin of U. S. Dept. of Agriculture. 7,500 words. Better Roads and Streets, April. 20 cts.

Streets:

The Cost of Wide Streets. Discusses 150-ft. street in small Arizona city and unnecessary expense involved. 600 words. Municipal Journal, April 13. 10 cts.

Grade Crossing Elimination at Passaic. Obtaining property. Avoiding damage claims. Grading with heavy and light steam shovels. Mixing and delivering concrete. Sewer reconstruction. Cost of the improvement. By R. F. Odell, Bur. of Engrg., Passaic, N. J. 5 ills., 2,200 words. Municipal Journal, April 27. 10 cts.

Traffic:

Traffic Laws and Highway Maintenance and Construction. Wheel loads supportable by different soils. Diminishing unit pressure. Limiting truck weights. Width of tires. State requirement. By Chas. C. Brown. 2,400 words. Municipal Journal, April 20. 10 cts.

Traffic Laws and Highway Maintenance and Construction. Destructive effect of speed on different kinds of roads with different tires and loads. Uniformity of speed regulations. Second installment. By Chas. C. Brown. 1,700 words. Municipal Journal, April 27. 10 cts.

For Federal Encouragement of Highways. Resolutions adopted by Highway Traffic Assn. of the State of New York. 1,100 words. Municipal Journal, April 20. 10 cts.

Miscellaneous.

Imperfect Back Filling Cause of Much Damaged Pavement. Plumbers more at fault than corporations, who take every precaution. Competent inspectors are expensive but needed. By Geo. S. Nobles. 1,000 words. Engineering News-Record, April 18. 20 cts.

Importance of Inspection of Paving Materials. By Messrs. Morgan, Campbell & Nolte. 1,200 words. American City, April. 40 cts.

Road Ditches Death Traps. Plea for substituting underground drains for side ditches. 400 words. Southern Good Roads, April. 15 cts.

Methods and Cost of Constructing and Maintaining Secondary Roads in Southern California. General construction method for oiled earth roads. By E. Earl Glass. 4 ills., 1,800 words. Engineering and Contracting, April 3. 15 cts.

Contract or Day-Labor Construction. Figures concerning the extent of road work done in the different counties of the country by day-labor. 400 words. Municipal Journal, April 27. 10 cts.

Interesting and Instructive Experiment with Convict Labor for Roads. Government operated camp in Georgia demonstrated under adverse conditions the efficiency and economy of the honor system. 4 ills., 1,000 words. Good Roads, April 27. 15 cts.

Road Organization. Suggestions for organizing the force for construction and for maintenance. Paper before Ontario Good Roads Assn. By F. A. Senecal. 1,600 words. Municipal World, April. 15 cts.

Stones Suitable for Crushing. Those available in each of several eastern and central states. 2,400 words. Stone, April. 25 cts.

The Creation of a More Equitable Contract Between Highway Comms. and Contractors. Paper before the American Road Builders' Assn. by James C. Travilla. 3,500 words. Better Roads and Streets, April 1. 20 cts.

Oklahoma Road for \$1.30 per Yard. Description of work on the Jefferson Highway. 7 ills., 700 words. Concrete, April. 25 cts.

Military Roads Imperative Necessity. Lessons drawn from experience in European countries. By Col. Wm. D. Sohler, Chm. Mass. Hwy. Comm. 2,000 words. Southern Good Roads, April. 15 cts.

Ontario Highways. Describing classification of roads and apportionment of government aid. Annual address by C. R. Wheelock, C. E., Pres. Ontario Good Roads Assn. 2,000 words. Municipal World, April. 15 cts.

Consideration Leading to Recommendations for Fine Screens, Sprinkling Filters, Humus Tanks and Sludge Recovery as Sewage Disposal Method for Indianapolis. Abstract of paper before Indiana Sanitary and Water Supply Assn., by Geo. W. Fuller. 4,200 words. Engineering and Contracting, April 10. 15 cts.

Sewerage and Sanitation.**Sewer Construction.**

Present Tendencies in Sewer Construction and Design. By H. K. Barrows. 5 ills., 2,500 words. Municipal Engineering, April. 30 cts.

Estimating Contractors' Overhead Costs in Sanitary Sewer Construction. With data from actual experience. Paper before Iowa Engineering Soc., by Stanley D. Moore. 400 words. Engineering and Contracting, April 10. 15 cts.

Protection Tunnel Used on Shield for Sewer Tunnel. Designed for constructing two miles of 6-ft. concrete sewer. Temporary lining of timber cants. 3 ills., 400 words. Engineering News-Record, April 4. 20 cts.

Sewage Treatment.

New Sewage Treatment Plant at Xenia, Ohio. By W. J. Sherman. 5 ills., 1,000 words. Municipal Engineering, April. 30 cts.

Specific Suggestions on the Design of Imhoff Sewage Settling Tanks. By Charles F. Mebus. 1 ills., 2,000 words. Municipal Engineering, April. 30 cts.

Experiences with Imhoff Tank Foaming Told by Sewage Works Operators. Engineers and chemists at Fitchburg, Schenectady, Rochester, Atlanta and Columbus sum up difficulties. How overcome, and give opinions as to causes. Good sludge digestion and removal of first importance. 2,000 words. Engineering News-Record, April 4. 20 cts.

Operation of Sewage Works in Iowa. Recommendation relative to septic tanks, Imhoff tanks, sludge beds and intermittent sand filters. General suggestion for

operating plants. Second installment. 4 ills., 4,000 words. Municipal Journal, April 6. 10 cts.

Operation of Sewage Works in Iowa. How to secure proper operation of plants. Supervision by designing engineer. Directions for operators. Third installment. By J. H. Dunlap. 4 ills., 2,500 words. Municipal Journal, April 13. 10 cts.

Suggestions on the Design and Operation of Sewage Treatment Plants. Abstract of paper before Iowa Engineering Soc. by Prof. J. H. Dunlap. 2,500 words. Engineering and Contracting, April 10. 15 cts.

Small Town Sewage Works Operation Problems Analyzed. Results of inspecting plants in 39 cities in Iowa presented to engineers of state by Prof. J. H. Dunlap. 2,300 words. Engineering News-Record, April 18. 20 cts.

Miscellaneous.

Concrete Sewer Pipe. Experience of the use of such pipe in San Diego, Cal. By A. E. Dodson. 700 words. Concrete, April. 25 cts.

Distinctive Characteristics of Institutional Sewerage. Design too often based on municipal practice. Data on quantity of sewage, variation in flow, effect of latter on sewer design, and quality of sewage in relation to treatment. By Henry W. Taylor. 3,600 words. Engineering News-Record, April 25. 20 cts.

Waterloo's Sewage Pumping Stations. Description of three small plants, cost of same, and experience in operation. Motor driven, automatically stopped and started. 1,000 words. Municipal Journal, April 6. 10 cts.

Sewers a War Necessity. Editorial giving reasons why cities should continue necessary sewer work. 800 words. Municipal Journal, April 13. 10 cts.

Water Supply.**Pumping.**

Centrifugal Pumps of St. Paul Water Department. Test of electrically operated plant with capacity of fifteen million gallons a day. Single-stage centrifugal pumps used. 1,500 words. Municipal Journal, April 6. 10 cts.

Modifying Centrifugal Pump for Direct Motor Connection. Limitations of Induction Motor Speeds May Necessitate Changing Pump Characteristics. By B. B. Jackson. 1 ills., 400 words. Electrical Review, April 13. 30 cts.

The Air-Lift Pumping System. General description by A. W. Swan. 1,000 words. Canadian Engineer, April 4. 15 cts.

High Efficiencies of Motor-Driven Water Works Pumps. Test of two electric pumps at McCarren pumping station in St. Paul. 1 ills., 2,000 words. Electrical Review, April 27. 30 cts.

Purification.

Water Purification in the Canal Zone. Spraying removes odors and free carbonic acid. Change in point of application of alum lengthens filter runs. 2,000 words. Municipal Journal, April 13. 10 cts.

Improving Quality of Meridian, Mississippi Water Supply. By M. L. Worrell. 1,500 words. Municipal Engineering, April. 30 cts.

Getting Chemicals for Treatment of Water in Ohio. State Dept. of Health aided water works. Federal cooperation obtained. 800 words. Engineering News-Record, April 25. 20 cts.

Liquid Chlorine Treatment Inexpensive. Detailed figures from two New York Cities. 600 words. Canadian Engineer, April 25. 15 cts.

Emergency Use of Portable Chlorine Sterilization Plants. Description of work done by New York State Dept. of Health. By E. Sherman Chase, Asst. Engr., Division of Sanitary Engineering. 1,100 words. Engineering and Contracting, April 10. 15 cts.

Construction.

The Sinking and Lining of Large Bore Wells for Public Water Supplies. English practice in methods and materials. By W. H. Maxwell. 3 ills., 4,500 words. Water and Water Engineering, March 20. 20 cts.

Reconstructing Water Plant Without Interrupting Service. Ft. Madison, Ia., replaces old pumps, boilers and buildings with new, one item at a time. Also builds storage reservoir and filtration plant, and new river intake. 5 ills., 2,500 words. Municipal Journal, April 13. 10 cts.

Reconstruction of Ft. Madison Water Works Plant Without Interruption of Service. Pumping plant, building, and intake replaced by new during winter

weather. 3 ills., 2,000 words. Fire and Water Engineering, April 17. 15 cts.

Fort Madison Water Works Rehabilitated by Citizens' Corporation. Pumping plant rebuilt, purification provided, new intake, duplicate force and reinforcing mains laid. Distribution system extended and universal metering begun without interrupting service. By R. E. McDonnell. 1 ills., 1,500 words. Engineering News-Record, April 18. 20 cts.

Testing Water Mains in Trenches. American practice described in an English paper, "The Surveyor." By R. O. Wynne-Roberts. 1,200 words. Canadian Engineer, April 25. 15 cts.

Service Pipe Corrosion.

Corrosion of Service Pipes. Investigation of effect of water treated in rapid filtration plants upon galvanized iron and lead pipes. Low alkalinity and free carbonic acid removes galvanizing. Low alkalinity required by high temperature. 3 ills., 1,600 words. Municipal Journal, April 6. 10 cts.

Pipe Corrosion in Domestic Service. Results of an investigation in Pittsburgh. 500 words. Engineering and Cement World, April 1. 15 cts.

Thawing Frozen Pipes.

Method of Thawing Service Pipes with Electric Current. Suggestions made by Hydro-Electric Power Comm. of Ontario. 3 ills., 700 words. Engineering and Contracting, April 10. 15 cts.

Duluth Water and Light Dept. Freezing of water and gas mains. High prices increase cost. No extensions on ungraded streets. Assessing extension costs. 900 words. Municipal Journal, April 6. 10 cts.

The Cost of Electrically Thawing Water Mains at Lawrence, Kans. 500 words. Engineering and Contracting, April 10. 15 cts.

Electrical Thawing of Water Pipes. Description of method employed at Trenton, Ont. By Fred C. Adsett. 1,100 words. Canadian Engineer, April 11. 15 cts.

The Profit to a Water Dept. from Thawing Frozen Service Pipes. 500 words. Engineering and Contracting, April 10. 15 cts.

Dams and Reservoirs.

Multiple-Arch Dam Construction in California. Method of calculating and description of two California dams by J. F. Springer. 10 ills., 5,500 words. Engineering and Cement World, April 1. 15 cts.

Middle Section of Upstream Side of Calaveras Dam Slips into Reservoir. Part of clay core also goes, and 230-foot outlet tower topples. Estimated that slide involves 800,000 of 2,800,000 yards placed to date. First problem now to open buried outlet culvert. By Allen Hazen and Leonard Metcalf. 5 ills., 2,500 words. Engineering News-Record, April 4. 20 cts.

Tumalo Irrigation Storage Reservoir Leaked Profusely and Erratically. Engineering and geological investigation of site last summer at cost of less than \$5,000 would have saved the state of Oregon a loss of nearly \$200,000 if made before beginning reservoir construction. By J. P. Newell. 1 ills., 2,700 words. Engineering News-Record, April 18. 20 cts.

Great Concrete Reservoir Built with Portable Mixers. Structure above ground has counterfort walls with unusual expansion joints. Holds 45,000,000 gallons, materials delivered by industrial track. By E. J. Lieber. 4 ills., 2,200 words. Engineering News-Record, April 11. 20 cts.

Why Some Irrigation Canals and Reservoirs Leak. Unsuspected subterranean cavities cause settlements when water is turned in. Experiences in half a dozen far western states outlined. By A. P. Davis. 1 ills., 2,500 words. Engineering News-Record, April 4. 20 cts.

Method of Repairing Revetment of Belle Fourche Dam. Concrete blocks on earthen dam displaced by wave action. By B. E. Hayden. 2,000 words. Engineering and Contracting, April 17. 15 cts.

Miscellaneous.

Flow Capacity of Water Pipes. Instructions and diagram for calculating capacity. By C. F. Wagner. 1,000 words. National Fire Protection Assn. Quarterly, April. 50 cts.

Trenton Water, Sewer and Garbage Depts. Service satisfactory under municipal ownership. 1,500 words. New Jersey Municipalities, April. 25 cts.

Water Supply Problems of Chicago. General recital of difficulties encountered, by Bureau of Public Efficiency. 3,000 words. Fire and Water Engineering, April 10. 15 cts.

The Greater Winnipeg Water District. General description of project of bringing water from Indian Bay, a distance of 96.5 miles. By C. S. C. Landon. 3 ills., 5,000 words. Canadian Engineer, April 4. 15 cts.

The Greater Winnipeg Water District. Second installment. By C. S. C. Landon. 5 ills., 2,500 words. Canadian Engineer, April 11. 15 cts.

Annual Report of the Water Dept. of Bangor, Me. From report of Supt. M. A. Sinclair. 3 ills., 2,000 words. Fire and Water Engineering, April 10. 15 cts.

Annual Report of the Water Dept. of Duluth. Revenues, use of meters, extension of mains, etc. 1,600 words. Fire and Water Engineering, April 24. 15 cts.

Annual Report of the Water Dept. of Detroit. Complete report of Superintendent Leisen. 1 ill., 2,500 words. Fire and Water Engineering, April 3. 15 cts.

Street Lighting and Power.

Method of Improving Power Plant Economy. Reiteration of principles involved in efficient combustion of coal with suggestions as how this end can be attained. 1,500 words. Electrical World, April 13. 15 cts.

Practical Measures for Securing Greatest Economy in Utility Power Plant Operation. Second installment. By Chas. Brossman. 2,500 words. Municipal Engineering, April. 30 cts.

Government Specifications and Tests for Incandescent Lamps. New specifications available for other purchasers, such as central stations. Accelerated tests. 1,400 words. Electrical Review, April 27. 30 cts.

Economizing in Street Lighting. Adopting lamps, globe, reflector and other details to secure maximum illumination of street surface with minimum of current. 6 ills., 1,200 words. Municipal Journal, April 27. 10 cts.

New Station of Kansas City Light & Power Co. Work being pushed on large and efficient plant to overcome power shortage. Ultimate capacity to be 150,000 kilowatts, of which 50,000 are being installed in two units. 3 ills., 1,700 words. Electrical Review, April 20. 30 cts.

Lincoln's Lighting Department. Current furnished for street and domestic lighting. Incandescent lamps replace carbon arcs. Cost of street lighting reduced. 700 words. Municipal Journal, April 6. 10 cts.

The Boston Street Lighting Division. Editorial comment on rate case before Mass. Gas & Electric Lt. Comm. 1,000 words. Electrical Review, April 20. 30 cts.

Linking Up Rural Communities in Iowa. Transmission line economics and centralized generation enable scattered settlements to have electricity supply. 6 ills., 3,000 words. Electrical Review, April 6. 30 cts.

Mapping and Recording Distribution and Transmission Systems of Gas Companies. A discussion of methods employed and a suggested method. Keeping and cost of various features. Record forms. By C. E. Steller. 10 ills., 1,800 words. American Gas Engineering Journal, April 20. 10 cts.

Street Cleaning and Refuse Disposal.

Snow Plow on Motor Truck Bucks Four-Foot Drifts. Mold board constructed of 2x4 surfaced with twenty-gage sheet-steel. Spreader at rear levels ridges. By F. P. Stott. 2 ills., 500 words. Engineering News-Record, April 14. 20 cts.

Rotary Disc Plow for Snow Removal. Developed last winter by the Chicago South Park Commrs. 2 ills., 400 words. Engineering and Contracting, April 3. 15 cts.

Methods and Cost of Snow Removal Work by South Park Commrs., Chicago. Itemized records of areas and costs on three separate days. 2,000 words. Engineer and Contracting, April 3. 15 cts.

Methods and Cost of Snow Removal. Experience of South Park Commrs. of Chicago. By H. F. Richards, Supt. 2,000 words. Canadian Engineer, April 18. 15 cts.

Device for Roughening Snow-Packed Sidewalks. Used in Ottawa, Ont. 1 ill., 50 words. Engineering and Contracting, April 3. 15 cts.

The Lighting of New York City's New \$3,000,000 Garbage Disposal Plant. By A. L. Powell. 3 ills., 1,800 words. American City, April. 40 cts.

Motor Trucks in Snow Removal Work in Loop District, Chicago. Last Winter's

Work by the Street Dept. 800 words. Engineering and Contracting, April 3. 15 cts.

Miscellaneous.

Bridges.

Concrete Encased Plate Girder Bridge of Unusual Design. Description of a plate girder structure with shallow floor, on account of limited clearance over Philadelphia and Reading Railway tracks at Cambria St., Philadelphia, by Albert M. Wolf. 2 ills., 1,400 words. Engineering and Cement World, April 1. 15 cts.

Bridge Patent Litigation in Iowa. History of concrete bridges and decision in the Luten Patent Case. 3,000 words. Engineering and Cement World, April 1. 15 cts.

Necessity for Engineering Supervision Over Bridge Maintenance. Discussion of the several features requiring supervision and reasons for deterioration. By G. P. Burch, Bridge Engr., Illinois Dept. of Public Works. 10 ills., 3,000 words. Engineering and Cement World, April 15. 15 cts.

Wooden Floors on Highway Bridges Are Now Obsolete. Modern motor-truck loadings overtax the stringers. Fire in floor planking likely to destroy the trusses. By J. A. L. Waddell. 1,200 words. Engineering News-Record, April 25. 20 cts.

Fire.

Fire Prevention Work in Canton. Abstract from report of Fire Chief R. O. Mesnar. 1,600 words. Fire and Water Engineering, April 13. 15 cts.

The Two-Platoon System. Recent action in regard to its adoption by Fire Depts. in many places in the U. S. 1,000 words. Fire and Water Engineering, April 17. 15 cts.

Arson Convictions in the State of Kansas. Work done by State Fire Marshal L. T. Hussey. 1,500 words. Fire and Water Engineering, April 24. 15 cts.

Firemen's Pensions. Jersey City said to have decreased from \$100,000 to \$32,000. 1,200 words. Fireman's Herald, April 6. 10 cts.

Government and Finance.

The Instability of Municipal Reform. Editorial comment upon the return of Philadelphia to the control of politicians. 700 words. Municipal Journal, April 27. 10 cts.

Municipal Finance. Its Relation to Pavement Construction and Renewals. Paper before American Soc. of Municipal Impvts. By Geo. C. Warren. 1,000 words. American City, April. 40 cts.

"Cost-Plus-a-Fee" Contract for Public Works Letting. Form of contract used at Kansas City, Mo. 1,000 words. Engineering and Contracting, April 24. 15 cts.

Rates for Public Utilities Service. Cost of service, origin of expenses, differential rates and other considerations entering into the problem. Paper before Illinois Gas Association by J. M. Spitzglass. 5,500 words. The Gas Age, April 1. 25 cts.

Motor Vehicles.

San Francisco's Municipal Bus Line. First municipal line, recently put into service. 1 ill., 200 words. Municipal Journal, April 27. 10 cts.

Seattle Keeps Accurate Records of Auto Trucks and Automobile Operations. Street and sewer department cuts operating costs in half in two years. Complete daily, monthly and yearly records for each car. Comparative results for cars summarized and posted. By C. A. Osier. 3 ills., 1,000 words. Engineering News-Record, April 4. 20 cts.

Return Loads Bureau. Spread of the idea throughout the eastern states. 700 words. Municipal Journal, April 20. 10 cts.

Street Railway Fares.

Increased Electric Railway Fares. Review of the movement to secure additional revenue throughout the United States. 6,000 words. Aera, February. 30 cts.

Progress of Fare Increase Movement. Narration of recent occurrences that mark effort to secure living wages for railways. 3,000 words. Aera, April. 30 cts.

The Trend of Regulation of Street Railways. Some decisions and opinions of courts and commissions. 2,000 words. Aera, April. 30 cts.

Relief for Public Utilities. Necessity in the interests of the National Government. By Thomas N. McCarter, President Public Service Corporation of New Jersey. 1,000 words. Aera, April. 30 cts.

Electric Lines and Traffic Congestion. Plans being worked out for further use-

fulness in relieving conditions—"skip" stop system finding increased favor—adoption of "staggered" hours as patriotic duty. 2,000 words. Aera, April. 30 cts.

Direct From Producer to Consumer Via Municipal Markets. Brief description of municipal marketing in New Jersey Cities. By A. L. Clark, Chief, Bur. of Markets, New Jersey State Dept. of Agriculture. 4 ills., 1,500 words. New Jersey Municipalities, April. 25 cts.

Underground Steam Mains. Describes the various types of conduits in common use. By Charles L. Hubbard. 2 ills., 2,400 words. Power, April 16. 10 cts.

Bonus for Laborers Increase Yardage and Lower Cost of Paving. In face of severe labor shortage, Flint, Mich., contractor speeds up work by paying premium to every man in gang. By Clarence E. Ridley. 800 words. Engineering News-Record, April 11. 20 cts.

Economic Consideration in Municipal Engineering Designs. Explanation of features entering into such designs. By Clinton S. Burns. 2,500 words. Engineering and Contracting, April 10. 15 cts.

Engineering Students and the War. Editorial advocating increasing the sizes of classes in technical schools. 650 words. Municipal Journal, April 27. 10 cts.

Public Works and the City Engineer. Report of Bur. of Municipal Research on the desirable coordination of the city engineer's department and the street department. 800 words. Municipal Journal, April 6. 10 cts.

Characteristics of Dynamite. Suggestions for keeping and using it. 1,200 words. Southern Good Roads, April. 15 cts.

Waterproofing Cement Pole Settings. Sealing top of concrete setting with tar. 1 ill., 700 words. Engineering and Cement World, April 1. 15 cts.

PERSONALS

Bowers, S. E., assistant city park engineer of Cleveland, O., has been appointed head of the new division of underground works of the city.

Hurtgen, P. J., who has been acting city engineer of Kenosha, Wis., has been elected city engineer for the coming year. Mr. Hurtgen has been dividing his services between Burlington, Wis., and Kenosha, but will give his entire time to Kenosha. Ben Brennan, former city engineer, is now with the United States Army in France, and his position is to be held open.

McFall, James, formerly chief of the Roanoke, Va., fire department, is now general fire marshal of the Emergency Fleet Corporation, U. S. Shipping Board, and is located at Washington at present. He is secretary of the International Association of Fire Engineers and is very well known by the chiefs of the country.

O'Neil, J. Denny, state highway commissioner of Pennsylvania, is a popular candidate for the Republican gubernatorial nomination. Mr. O'Neil is fifty-two years of age and has been a business man for thirty-two years, a department store merchant, a banker and a newspaper owner of McKeesport. He is a stockholder and director in several other business concerns in the western part of the state. He made a national reputation for himself as Insurance Commissioner of this state, having cleaned up the crooked companies in Pennsylvania. He has been active in public matters for twenty-eight years. He was recorder of

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NEWS OF THE SOCIETIES

CALENDAR OF MEETINGS.

May 13-17.—AMERICAN WATER WORKS ASSOCIATION. Annual convention, St. Louis, Mo. Secretary, J. M. Diven, 47 State street, Troy, N. Y.

May 14.—AMERICAN ASSOCIATION OF ENGINEERS. Fourth annual convention, Chicago, Ill. Secretary, A. H. Krom, 29 South LaSalle St., Chicago.

May 15, 16.—SOUTH DAKOTA ELECTRIC POWER ASSOCIATION. Annual convention, Carpenter Hotel, Sioux Falls.

May 15-22.—NATIONAL CONFERENCE OF SOCIAL WORK. Annual conference, Kansas City, Mo. Secretary, William T. Goss, 315 Plymouth Court, Chicago, Ill.

May 21-23.—ARKANSAS ASSOCIATION OF PUBLIC UTILITY OPERATORS. Annual convention, Hot Springs, Ark.

June 4-6.—INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS. Annual convention, Chicago, Ill. Secretary, Chief James McFall, P. O. Box 1015, Washington, D. C.

June 4-7.—AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Spring meeting, Worcester, Mass.

June 13, 14.—NATIONAL ELECTRIC LIGHT ASSOCIATION. Annual meeting, Hotel Traymore, Atlantic City, N. J. Secretary, T. C. Martin, 33 West 39th St., New York City.

June 24-26.—AMERICAN CONCRETE INSTITUTE. Annual meeting, Atlantic City, N. J.

June 25-28.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary-treasurer, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

June 26-28.—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Annual convention, Atlantic City, N. J. Secretary, F. L. Hutchinson, 33 West 39th St., New York City.

International Association of Fire Engineers.

The annual convention of the International Association of Fire Engineers will be held in Chicago June 4, 5 and 6, with headquarters at the Sherman House.

An exhibit hall has been secured for the display of small equipment. This room adjoins the convention hall in the Hotel Sherman. Applications for space should be made direct to Chief W. B. Cody, Atlanta, Ga., chairman.

The following subjects have been handed the secretary for discussion at the Round Table meeting on Wednesday night. Other subjects may be presented at the time of the meeting:

Fire Equipment and Protection of Our National Shipyards.

Exercise and Recreation, What Provisions Are Best?

How Can Inspection of Buildings Best Be Carried On in Two-platoon Departments?

Can Men in Off-shift in Two-platoon Departments Be Depended on for Serious Fires? If So, What Arrangements Are Best for Calling Them?

The Small Village Fire Department. The Absolute Elimination of the Wooden Shingle by State or Municipal Legislation.

Cellar Drainage.

Use of Flying Squadron.

What Has Been Accomplished in the Past Five Years by Fire Prevention?

The Storage and Handling of Explosives.

The following topics will be discussed in the speeches:

"Automatic Sprinkler Alarm Service," John Kenlon, chief, New York, and F. A. Raymond, engineer, National Board Fire Underwriters, New York.

"The Relation of City with Industrial Plant Departments and the Best Method of Co-operation," Philip J. Harty, fire chief, Youngstown Sheet & Tube Co., Youngstown, Ohio; N. V. Holmes, fire marshal, Sears, Roebuck & Co., Chicago, and Thomas J. O'Connor, fire chief, General Electric Co., Schenectady, N. Y.

"Exposure Hazards," William H. Murphy, chief, Philadelphia, Pa.

"Four-wheel Motor Apparatus," William H. Daggett, chief, Springfield, Mass.

"Drill and Training, What Kind? How Frequently? And What Provision Necessary For?" Frank G. Reynolds, chief, Augusta, Ga., and R. F. McLaughlin, chief, Norfolk, Va.

"Feasibility of Gasoline Engine Driven Fire Boats," Charles Schnibb, chief, Wilmington, N. C., and A. D. Stevens, marine engineer, Jacksonville, Fla.

"Fire Fighting in Vessels—Special Tools Needed," dep. chief Worth, New York, and district chief Shallow, Boston, Mass.

"The Proper Safeguarding and Prevention of Fires in Mills and Elevators," C. W. Ringer, chief, Minneapolis, Minn.

American Association of Engineers.

The Chicago chapter of the American Association of Engineers recently attempted to arouse local engineers to a greater sense of their civic duties and to get them to thinking on public

questions. It sent its members a ballot on five subjects which were not discussed or qualified in any way. The chapter has about 650 members but only 110 voted. The results were as follows: For national prohibition, 88%; for national women's suffrage, 92%; for city manager plan for Chicago, 96%; for an engineer in city council, 99%; for engineer for smoke inspector, 100%.

Co-ordination of engineering society activities is to be the principal subject of discussion May 14 at the annual convention of the American Association of Engineers meeting jointly with the Committee on Engineering Co-operation. Delegates from 250 national, state and local societies have been asked to attend this forum, the main idea in mind being "What More Can Engineers Do to Win the War?"

To assist the delegates in their survey of society service all societies have been requested to submit answers to 24 questions on society activities, war programs, employment features, education and publicity.

The following speakers are on the program: Major Gardner S. Williams, E. T. Perkins, C. E. Drayer, Col. Charles S. Riche, Corps of Engineers, Alfred D. Flinn, secretary Engineering Council, and W. H. Finley, chief engineer, Chicago & North Western Railway.

Southwestern Water Works Association.

The recent convention of the Southwestern Water Works Association, held in Tulsa, Okla., April 23, 24, 25 and 26, was featured by a number of interesting and well-received papers.

Tuesday morning was taken up with the formal speeches, including the address of welcome by mayor J. H. Simmons of Tulsa and the president's address.

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PROBLEMS CITIES ARE STUDYING WITH EXPERTS

A SEWAGE DISPOSAL PLANT is to be built by Jewell, Ia., plans having been completed by Chas. H. Currie.

A SEWER SYSTEM is to be built by Parker, S. D. Plans and specifications for the work were prepared by the engineer, W. L. Bruce.

BRIDGE REPAIRS are to be made by Delaware county, Media, Pa. Plans for the work have been prepared by James B. Long.

A number of STREETS are to be improved by Blissfield, Mo. The engineers for the work are the firm of L. A. Boulay Company.

A comprehensive CITY PLAN, including a SEWER SYSTEM, etc., is being developed for St. Augustine, Fla., by the American Park Builders.

The Little River Drainage District, Cape Girardeau, Mo., is to construct a SPILLWAY, plans for which were prepared by the engineer, Isham Randolph.

A WATERWORKS SYSTEM is to be built by Bushnell, Neb. The system was designed by the engineer, R. D. Salisbury.

The town of San Pedro, Cal., is to build a SEWAGE DISPOSAL PLANT, plans for the work being in process of preparation by the engineer, A. C. Hansen.

WATERWORKS and SEWERAGE SYSTEMS are to be constructed at the new quartermaster's depot near Harrisburg, Pa. The firm of Gannett, Seelye & Fleming has been appointed in a consulting engineering capacity.

INDUSTRIAL NEWS

Cast Iron Pipe.—Government prices remain constant. Quotations: Chicago, 4-inch, Class B and heavier, \$57.30; 6-inch, \$54.30. New York, 4-inch, Class B and heavier, \$58.35; 6-inch, \$55.35; 3-inch, \$65.35. Birmingham, 4-inch, Class B and heavier, \$52; 6-inch, \$49; Class A, \$1 extra.

Exhibits at Water Works Convention.—Burt H. Hodgman, chairman, exhibit committee, Water Work Manufacturers' Association, has issued a statement emphasizing the ruling of the committee that only fifty pounds of exhibits may be shown at the convention. This is exclusive of photographs and pictures.

The Aspromet Company, Pittsburgh, Pa., announces the removal of its New York office to 170 Broadway.

The United Brass Mfg. Co., Cleveland, O., announces that R. F. Valentine has been appointed sales manager. Mr. Valentine was formerly connected with the Mechanical Rubber Co., the Sawyer Belt Co. and the Boston Woven Hose and Rubber Co. He takes the place of Sam P. Schoenberger, who has resigned.

The National Gas Engine Association is to hold its eleventh annual meeting at the Sherman Hotel, Chicago, June 3-4. The subjects to be discussed on Monday are as follows: "The Iron and Steel Situation"; "Government Requirements on Gas Engines and the Method of Handling Those Matters at Washington"; "The Labor Situation"; "The Fuel Problem," which will be handled by a representative of the Federal Fuel Administration. On Tuesday forenoon the following paper will be read: "What Is the Future of the Farm Gas-Engine Business"; "Sizes of Manufacture from the Manufacturing and Sales Standpoint"; "The Present Condition and Future of the Gas-Engine Export Trade." On Tuesday afternoon there will be a technical session in connection with the Midwest Section of the Society of Automotive Engineers, at which a number of papers of a technical nature will be presented and discussed.

The American-La France Fire Engine Co., Elmira, N. Y., recently made the following shipments: Highland Park, Mich., type 17 6-cylinder 75-foot aerial truck; Seattle, Wash., type 14 combination service truck, type 30 triple combination; Somerset, Mass., type 40 combination; Wheeling, W. Va., type 45 triple combination chemical engine and hose car, type 12 combination tractor; Boise, Idaho, type 31 steamer tractor; Louisville, Ky., type 10 combination chemical engine and hose car; Ferry, Ohio, type 31 aerial truck; Seattle, Wash., two type 12 combinations; Watervliet, N. Y., type 12 triple; Charleston, W. Va., type 12 triple;

Peekskill, N. Y., type 12 combination chemical engine and hose car; Pottstown, Pa., type 17 tractor; Cherokee, Iowa, type 40 combination chemical engine and hose car; Beverly, Mass., type 12 triple combination; Pulaski, N. Y., Brockway type B combination chemical engine and hose car; St. Louis, Mo., type 45 combination chemical engine and hose car; Sioux Falls, S. D., type 31 85-foot aerial truck; Norristown, Pa., type 12 combination chemical engine and hose car; Jersey City, N. J., type 31 75-foot aerial truck; Newark, N. J., two type 45 triple combination chemical engine and hose car.

PERSONALS

(Continued from page 404.)

deeds in Allegheny County and placed a new system in operation. He was commissioner of Allegheny County for seven years and had charge of the road building. During his term over 300 miles of new roads were built and all important toll bridges in the county were made free. During the time he has been highway commissioner he has succeeded in creating a good feeling between the various counties of the state and the highway department, has secured an agreement with the majority of the counties whereby they pay half the cost of roads built in their counties. He is gradually freeing the toll roads of Pennsylvania. He accomplished a difficult task in the winter of 1917-1918, the most severe in the memory of many, when, through a concentration of his highway forces, he kept the roads across Pennsylvania from Ohio to the seaboard open all the time for the transportation of army trucks and supplies. He favors equal suffrage. He is state chairman of the Local Option Committee of Pennsylvania. He is a Trustee of the Anti-Saloon League of Pennsylvania and he is also a director of the Dry Federation of the state. The good roads plank in his platform says, in part:

"To keep the people on the farms give them good roads to get to the markets, and the same to the people who are employed in the cities and live in the country. The present road laws were passed by the politicians and for the politicians and they have always refused to appropriate sufficient money for maintenance and construction. The revenues of this great state are sufficient to construct a comprehensive system of roads if the business of the state is conducted along economic lines. I am in favor of an act which will give the boroughs and townships more aid in the construction of local roads. I have already inaugurated a plan whereby the state pays 50 per cent of the cost of any state highway passing through a borough. This plan is working successfully. The supervisors of the various townships of the state have 80,000 miles of roads to maintain while the state has only 10,300. Therefore, I favor a plan whereby the state can make appropriations to townships for the construction and maintenance of their roads, with local help and local material. When the conditions permit I favor the construction of an improved road on one side for automobile and heavy truck traffic and the maintenance of a dirt road on the other side for teams and horses. I favor the state taking over all bridges on state highways and the erection and maintenance by the state of such bridges in the future. I am opposed to the earth roads of the state being turned back on the counties."

NEWS OF THE SOCIETIES

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In the afternoon the following papers were presented: "Operating Difficulties in Mechanical Filter Plants," C. Arthur Brown, Chicago, Ill.; "Water and Sewage Sterilization," C. A. Jennings, New York; and "Cement for Cast Iron Water Pipe Joints," Henry E. Elrod, Dallas, Tex. The session was followed by an auto ride over the city.

On Wednesday morning the members heard the following papers: "History Outline of the City Waterworks of Tulsa," E. M. Stevens, city engineer; "After the War Prices on Waterworks Materials," R. F. McDonnell, and "Pumping by Electricity," M. L. Whitney, Dallas, Tex. These papers were followed by the Question Box.

The afternoon was pleasantly occupied by an exhibition of Tulsa's new pumping engines at Owens Park Lake and an auto trip to the city filtration plant, where there was presented a demonstration of a 20-inch valve insertion under pressure, by a representative of the A. P. Smith Mfg. Co., East Orange, N. J. A theater party was enjoyed in the evening.

Thursday morning was devoted to the following papers: "Cleaning of Water Mains, Methods and Results," Burt B. Hodgmen, New York; "Engineering and Chemicals," H. H. Howard, Dallas, Tex., and "Rules and Regulations Covering Municipal Water Plants," T. O. Cheatham, Waxahachie, Tex. These were followed by an address on "Improvement in Water Mains," by M. Griffin O'Neil, representative of the Central Foundry Company of New York. A trip to Sand Springs, Orphan Home and Hospital, an informal dance, general sports, a ball game between superintendents and supply men occupied the afternoon, and a banquet was held in the evening.

Friday was taken up with the election of officers and unfinished business.

Health Insurance Conference.

Health and old age insurance commissions of seven other states besides Ohio have been invited to Cleveland for a conference on May 13 and 14.

The meeting is for the purpose of mutual cooperation between the commissions who are studying health insurance and old age pensions.

The states to be represented besides Ohio are California, Wisconsin, Illinois, Pennsylvania, New Jersey, Massachusetts and Connecticut.

Royal Meeker, United States Commissioner of Labor Statistics, will be present to offer the various commissions the help of the federal government. Mr. Meeker is already gathering a large amount of data for the Ohio commission and this will be made available for the other states.

The special topic to be presented is methods of investigation. This subject will be discussed by John A. Lapp, the Ohio director.